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A POLLEN SURVEY OF THE ISLANDS OF BERMUDA.

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A haven of refuge for hay-fever and pollen asthma sufferers has long been sought. New Hampshire is no longer satisfactory because offending grasses and ragweeds have invaded its seclusion. Northern Michigan and Southern California are comparatively free of ragweed pollen, but have other complicating factors.

The Islands of Bermuda were chosen for a survey of the pollen flora of the atmosphere because of their popularity with and their accessibility to the citizens of the United States. These islands are nearer New York than they are to the West Indies group. The exact location is 32 degrees, 14′ north latitude and 64 degrees, 49′ west longitude. The same latitude line passes through Charleston, South Carolina on the West and through the Madeira Islands and Jerusalem on the East. New York is 666 miles away.

In conjunction with their accessibility and popularity the Bermudas are a group of small islands exposed to ocean winds. It is recognized that prevailing winds from the ocean cleanse the atmosphere and lessen the influence of pollen on the mucous membranes of a sensitive individual.

The island group is slightly over nineteen square miles in size, fifteen miles long and three miles wide; the average width is somewhat less than one and a half miles. Originally Bermuda was a volcanic submarine mountain. The sea receded, the coral rock built up, and layers of earth have been deposited. The average depth of soil is estimated to be six inches.

The temperature of the islands varies but little. The mean temperature ranges in the winter months from 70 to 80 degrees.

The climate is mild, but damper than that of other places of the same latitude. The changes of wind are frequent and regular and are followed by hygrometric fluctuations.

This climate produces subtropical or warm temperature vegetation. Spring is the blossoming season for most annuals, but there are literally blossoms in every garden every month of the year. Roses, for example, bloom from October to July. The variety of trees is limited. No garden, however, exists without the native cedar (Juniperus Bermudiana).

With all of this profuse growth it is remarkable that only 8.7 per cent of the plant life is endemic. The large proportion has entered by natural agencies from America and the West Indies.

The survey which is reported was commenced March 1, 1939, and was concluded April 1, 1940. A single year was deemed sufficient for the survey, because the pollen cycle is considered regular with fluctuations due to seasonal variations only.

A standard microscope slide, lightly smeared with vaseline, was exposed for twenty-four hours on a relatively exposed elevation at the same station in Hamilton, Bermuda. The slide, which was replaced every day at the same time was protected from rain and excess precipitating dust by a metal shelter, open on four sides. The metal roof of the shelter did not interfere with the pollen which was caught on the slide as air borne pollen travels horizontally with the air currents.

The collected slide was stained with Calberla solution to aid in differentiating the pollen grains. A

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XUM

cover slip was placed on it. The exposed slide was then superimposed on a slide carefully calibrated in mm. and one square cm. was counted.

The pollen was identified by comparing unknown with known types and by reference to the keys to pollen identification by Wodehouse and by Moore and LaGarde.

In order that this survey might be compared with surveys made by other investigators throughout the United States, the succession of species was divided into the usual four seasons; namely, the tree season, the grass season, the plantain season and the ragweed season.

The tree season includes only the cedars and the candleberry myrtle. No other pollen grains were found on the slides in the tree season.

Cedar pollen was found on slides exposed during all but three months of the year—September, October and November. The peak of pollenation was confined to the first three weeks in March. The cedar pollen on the slides in late spring and early summer was probably not due to continued flowering, but to the sifting of old dry pollen from the soil and other vegetation.

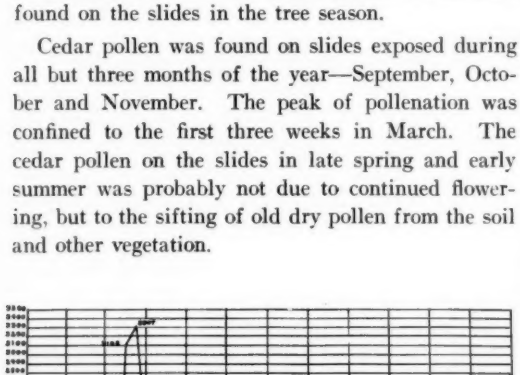

Figure 1.

The candleberry myrtle (Myrica cereferad) began to pollenate during the first week of March and was inactive by the first week of April. Thus far no case of clinical sensitivity to it has been brought to our attention.

The grass season began in May and terminated in early September. It had slight influence on the pollen content of Bermuda's atmosphere. There is an abundance of poorly nourished grass, but the prevailing winds, the proximity of land and sea account for the lack of pollen. There was at no time sufficient concentration of pollen in the atmosphere to precipitate respiratory symptoms. Clinical observations confirm the opinion that grass pollen hayfever is unknown or of no significance in Bermuda.

The plantain season was similar to that of the grasses. This pollen is a major factor in the cause of hay-fever in the spring in the United States. In Bermuda the count was so meagre that not even during the peak in October was there sufficient concentration to disturb sensitive patients.

There is no ragweed season in Bermuda. No ragweed pollen was found on any of the slides and no specimens of ragweed have been found on the islands. Bermuda is a safe haven for the ragweed sensitive patient.

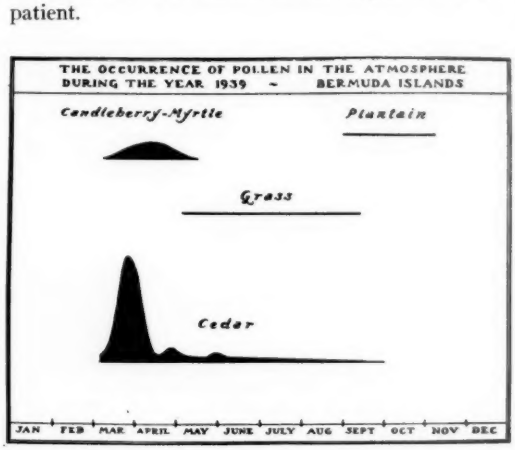
THE OCCURRENCE OF POLLEN IN THE ATMOSPHERE
DURING THE YEAR 1939 ~ BERMUDA ISLANDS
Candleberry-Myrtle
Plantain
Grass
Cedar
JAN FEB MAR APRIL MAY JUNE JULY AUG SEPT OCT NOV DEC

Figure 2.

An attempt was made to establish some criteria for predicting pollenation dates from weather reports. No evidence of correlation was found in the data on hand.

There is available, therefore, within easy travel distance of the United States a very satisfactory group of islands which has a constant year round atmosphere entirely free of the usual disturbing pollens of grasses, plantain and ragweed. Only in late February and March is there sufficient concentration of pollen to cause distress to sensitive patients. And the only sources of this pollen are two trees—the candleberry myrtle and the cedar. In the United States the number of cedar pollen patients is relatively small. To our knowledge no clinical survey

has ever been made of the native inhabitants of Bermuda with reference to cedar pollen sensitiveness, nor for the prevalence of hay-fever and asthma. At some future date this problem will be further elaborated.

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MEDIASTINAL EMPHYSEMA AND IDIOPATHIC SPONTANEOUS PNEUMOTHORAX.

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Severe pain in the chest, often accompanied by dyspnea or at least the realization that breathing requires effort and is no longer an automatic phenomenon, and occasionally followed by cyanosis and profuse perspiration, lead the sufferer's attending physician to suspect a cardiac calamity; sudden knife-like pains in the abdomen, together with nausea and vomiting, and accompanied by spasm of the upper abdominal musculature and leukocytosis, strongly suggest an abdominal lesion requiring prompt surgical treatment. Yet both of these distressful conditions might, and sometimes do, result from abnormalities not of the heart or digestive system, but of the mediastinal and pleural structures. Emphysema of the mediastinum, a collection of air in the mediastinal tissues, may by pressure upon adjacent cardiac and pulmonary organs and vessels simulate exactly the clinical picture of coronary thrombosis, or by the conduction of referred sensation may mimic the rupture or strangulation of an abdominal viscus.

Mediastinal emphysema and spontaneous pneumothorax are considered jointly in this paper, for the former may produce the latter, and both are often, but not always, associated. Our consciousness of the existence of mediastinal emphysema as a disease entity has been stimulated in the past few years, principally by the keen diagnostic skill of Dr. Louis Hamman,[1,2] of Johns Hopkins Hospital, and our awareness of the frequency of spontaneous pneumothorax in healthy persons has been greatly increased by the reports of Dr. Staige Blackford,[3] of the University of Virginia, and others.

The etiology of mediastinal emphysema is not proven, but Dr. Hamman's original observations upon humans link pulmonary interstitial emphysema and mediastinal emphysema. C. C. Macklin's[4] experiments upon animals seem to confirm Dr. Hamman's hypothesis. Briefly stated, the course of events is as follows:* because of a rupture or tear in the wall of an alveolus of the lung, air seeps into the alveolar connective tissue spaces and travels along the sheaths of the pulmonic blood vessels to produce interstitial emphysema. Thence the air dissects into the mediastinum. As the volume of air trapped in the mediastinal tissues increases, the air pressure is raised until a break through occurs at some point. Leakage may occur posteriorly into the retroperitoneal spaces, or upward into the neck and arms. In the type under discussion tonight, the air is displaced in a forward direction to infiltrate the areas between the parietal pleura and the pericardium. Thus blebs are formed overlying the heart, a condition known as pneumoprecordium. Additional compression of air, dammed behind the sternum and encircled by the heavy masses of the cardio-respiratory system, forces a rupture of the mediastinal wall into the pleural cavity, in effect to relieve the tension. Collapse of the lung follows, preventing further leakage into the vascular sheaths.

However, air may enter the pleural cavity to produce spontaneous pneumothorax by pathways other than the mediastinal route. Rupture of an air containing vesicle occurs, allowing air to escape into the pleural space.[5-9] This peripherally placed vesicle may rupture (1) because of a congenital weakness, (2) because of a fibrous valvular obliteration of smaller bronchi, or (3) because of a localized emphysema. An ingenious explanation[10] suggests that the continuous wear and tear on the pleural surfaces due to sliding friction of respiratory movements produce a constant shedding and regeneration of tissue cells, and that an area weakened by imperfect regeneration will be the site of rupture.

By roentgen ray examination following the reexpansion of the collapsed lung in five cases, Gordon[9] has discovered the site of ruptured subpleural

*Paraphrased from Hamman and Macklin.

blebs or bullae. A ruptured pleural bleb has been found at autopsy in one case reported by Kirshner,[11] and in another by Willcox and Foster-Carter.[8] In six cases at autopsy, Kjaergaard (quoted by Blackford[3]) found the cause of the spontaneous pneumothorax was "ruptured superficial air vesicles at the apices of otherwise healthy lungs."

The pathological physiology engendered by the escape of air into the relatively fixed spaces of the mediastinum follows logically. Rupture of an alveolus or a bleb underlying the visceral pleura produces discomfort located usually in the lateral chest wall. Tunnelling of air into the mediastinum increases the intramediastinal pressure, compressing the large vessels and sometimes the coronary arteries, or even tamponading the heart itself. Thus the shock symptoms simulating an attack of coronary thrombosis. Escape of air into the retroperitoneal spaces or reflex stimulation of viscero-sensitive nerves mimic the findings of an abdominal catastrophe. The greater the mediastinal air pressure, the greater the substernal pain, often agonizing in intensity. This substernal pain is caused by the mediastinal distention, while the lateral chest wall pain is caused by the alveolar rupture or interstitial pulmonic emphysema.

Respiratory distress naturally follows collapse of the lung, varying with the rapidity and amount of collapse and with the amount of mediastinal displacement. In experimental pneumothorax in healthy animals, Cole[21] records that the vital capacity of the animal is the greatest determining factor in relation to the amount of air in the pleura needed to produce respiratory distress. Also that the velocity with which air is introduced into a pleural space, and not the amount, will be the deciding factor of rupture of the mediastinum and consequent production of bilateral pneumothorax.

The occurrence rate of spontaneous pneumothorax and mediastinal emphysema is unknown. The former occurs far more frequently than the latter is diagnosed. Since Hall's[12] first account of spontaneous pneumothorax in the healthy in 1887, few cases were reported until the past decade. In 1939 and 1940, however, Blackford,[3] at the University of Virginia, reported 15 cases among healthy college students, giving an incidence rate of 1 per 1000 students per session. Norris[6] reported 25 cases; Van Ordstand,[13] 10 cases; and Perry,[5] 85 cases. In addition, scattered reports of 1 to 3 cases appeared.[14-20]

The condition appears most frequently in young men, though ages range from childhood to the sixth decade, and women are also affected. Recurrence has been noted in 4.4 per cent of one series.[5]

The onset of an attack of mediastinal emphysema or spontaneous pneumothorax is usually sudden, but may be delayed. The symptoms vary in intensity from mild to terrifying; the attack may even prove immediately fatal. Therefore, in a patient with an acute tension pneumothorax, diagnosis and treatment must be hurried. In over one-half of one series of cases the presenting symptoms occurred during exertion;[13] in another larger series the onset was seldom associated with exertion,[6] some patients being awakened during sleep by the pain.

A mild case may offer no complaints other than a slight pain in the chest and some difficulty in breathing. A severe attack, on the other hand, may prostrate a patient with unbearable knife-like or compressing pains, dyspnea, faintness and sweating; or in the abdominal form with pain, nausea, and vomiting. Differentiation may sometimes be made between two types of pain—one, a relatively mild pain in the chest wall due to pleural or pulmonary tearing, which may precede by several hours the intense constricting and sharp pain behind the sternum due to mediastinal distention with air.

Physical examination may, depending upon the amount and location of air present, demonstrate signs consistent with air in a pleural cavity, and also diminution in the area of cardiac dullness, with fading of heart sounds. Hamman has described an amazing sound heard at the precordial area, synchronous with the heart beat, described as a "crunching, churning" sound, audible often to the patient and even to persons distant many feet from the patient. This distinctive sound is not that of a friction rub, but is due to the crunching of air-distended tissues ground between the heart and the anterior chest wall. The sound usually disappears when the patient lies on his back, and can be made to reappear by leaning forward and to the left. Invariably the patient has noticed this noise before being examined by the physician. In the two cases which I wish to report, both patients were at first greatly alarmed by this sound, one believing that his heart was about to burst.

In many instances no other physical abnormalities are noted. However, abnormalities of temperature, pulse, blood pressure, and blood counts have been recorded, varying from 99° to 103°, from 120 to 160

beats per minute, a low blood pressure of 60 to 80 systolic[22], and leukocytosis up to 18,000. Confusion of the true diagnosis with acute abdominal pathology,[18,23] coronary thrombosis,[13] etc., may thus be created.

Roentgen ray examination is naturally most helpful. Air in the mediastinal areas or in the pleural cavities, found often only after expiration,[6] is of course diagnostic. Unfortunately for the ease of diagnosis, subcutaneous emphysema is seldom present.

Treatment of the benign case is simple—rest in bed for one or two weeks. For the tense case with great dyspnea, immediate relief of intrapleural pressure must be effected by introducing a needle into the cavity and withdrawing 500 c.c. or more of air.[23] For recurrent cases, the production of a chemical pleuritis has been advocated, intrapleural injections of iodized oil,[24] concentrated dextrose,[17] or gomenol in petrolatum[25] having been used successfully.

CASE REPORTS

Case 1.—A well developed, well nourished and athletic young woman, age 24, experienced pneumothorax on six occasions.

First attack: In January, 1937, while enjoying perfect health, she leaned over to pick up a letter on the floor and felt a sudden knife-like pain in the upper part of her back on the left side. The pain prevented her straightening up and was made worse if she took a deep breath. She felt that she was unable to fill her lungs completely with air. This pain gradually subsided so that she was without discomfort within thirty minutes, but the pain could be made to reappear by deep inspiration or by a sudden movement of her body in any direction. When lying down in bed that night, the pain reappeared, penetrating from the back to the precordial region. The pain was greatly increased by adhesive strapping applied to the chest as in the treatment of pleurisy. X-ray the following morning showed complete collapse of the left lung. At the end of four weeks the lung had re-expanded

Second attack: In January, 1938, being tired after a head cold, she felt a mild pain in the left chest. Upon leaning forward, she could feel a "weight" shifting in her chest, increasing the pain and producing slight dyspnea. Again X-ray showed a complete collapse, and the lung re-expanded in fourteen weeks.

Third attack: In December, 1938, while in robust health leading an active life on an Arizona ranch, she awakened one morning with a heavy, dull feeling in her left chest. Again she noted the sensation of a shifting weight, dyspnea and pain when leaning forward.

However, she also noted a loud clicking, snapping noise, synchronous with her heart beat and audible at all times no matter what position she assumed. In addition, when lying on her left side, she heard another sound, a "crunching, crackling sound like small chicken bones being crushed". This sound she can not say with certainty was synchronous with her heart beat. Both sounds were easily audible to persons in the room with her.

Both the clicking and the crunching noises could be produced at will during the time in which her lung was either collapsing or re-expanding. Re-expansion was complete in two weeks.

Fourth attack: In March, 1939, while in good health enjoying a short walk, she noticed a heavy sensation in her left chest. On leaning forward, the "shift of weight" was felt. Several hours later the loud clicking noise and the crunching sound became audible. X-ray taken within a hour showed a small amount of air in the apex of the left pleural cavity, visible only after full expiration. Re-expansion was complete in six weeks.

Fifth attack: In June, 1940, the heavy sensation reappeared together with the usual symptoms. Again the very loud clicking noise synchronous with each heart beat was easily audible to any one within twenty or more feet of her, and slightly less audible was the crunching noise heard when she sat leaning forward to the left side, also synchronous with the heart beat.

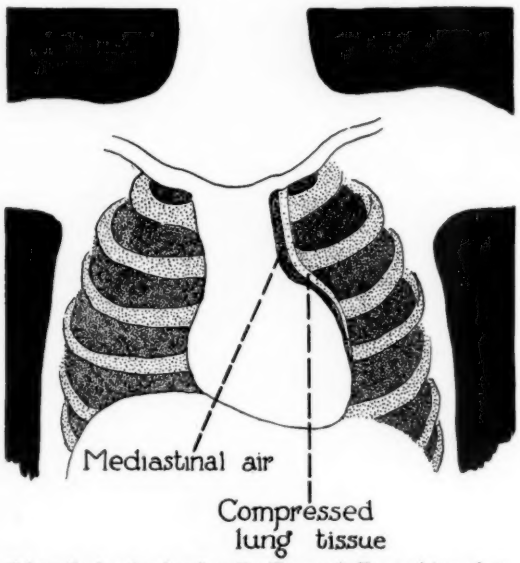
The sounds were present during the process of collapsing and re-expansion. Re-expansion was complete in six weeks.

X-ray about four days after onset of symptoms showed a small air pocket in left pleural apex, visible only after full expiration.

Sixth attack: On March 12, 1941, having gone to full term of pregnancy, this patient entered Stuart Circle Hospital under the care of Dr. W. D. Suggs, active labor having begun spontaneously with rupture of membranes. The duration of the first stage of labor was twelve and one-half hours; of the second fifteen minutes; and of the third five minutes. Sedation with nembutal, six grains, and hyoscine 1/120 grain, was followed by novocain infiltration

and vitrous oxide anesthesia. Fortunately the duration of the second stage was brief. About four hours after delivery the patient stated that she could feel in her chest pains similar to those noted at the onset of each attack. Pneumothorax became complete within thirty-six hours and persisted for four weeks.

Case 2.—A twenty-five-year-old man, in October, 1938, while engaged in sedentary office work, suddenly developed a severe pain in the left chest



Schematic drawing based on Dr. Hamman's X-ray picture showing area of lessened density due to mediastinal emphysema.

posteriorly, made worse by movements and breathing. Examination revealed no pathology of the chest, but mild pharyngitis. The pain gradually subsided over a period of several days. When lying down at bed time on the third night after the onset of pain, both the patient and his wife were startled and terrified to hear a loud clicking noise emanating from the region of the patient's heart. Upon approaching the patient's bed, this sound became audible at a distance of several feet. Physical examination demonstrated no abnormalities other than this loud crackling noise, synchronous with the heart beat. There was practically no pain. The sound persisted for approximately twenty-four hours. At no time was air in the pleural cavity demonstrated. Roentgen ray examination was not made. Two years later, however, during another illness, Drs. Hodges and Snead reported a chest film normal.

In August, 1940, Dr. Blackford was asked to examine the female patient, then pregnant, to advise of the risks attendant upon going to term and sustaining labor. During his discussion of the case, particularly of the nature of the peculiar chest sounds heard, Dr. Blackford pointed out that mediastinal emphysema undoubtedly produced these sounds. Failure of X-ray plates to show air in the mediastinal tissues and along the border of the heart shadow may be due to the fact that pictures were not taken in the oblique or lateral positions. Dr. Blackford's discussion and the nature of the sounds heard in this woman's chest recalled to the writer the amazing sounds heard two years before in the second case reported, which had at the time been attributed to a pleuropericardial friction rub.

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Medical Arts Building.

UNUSUAL TUMORS OF THE BRAIN—
With Emphasis on Pathological and Diagnostic Pitfalls—
A Report of Five Cases.*

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Introduction:

The diagnosis of intracranial tumor or other mass lesion of the brain in any individual patient, from the clinical findings alone, may be easy or one of the most difficult problems in medicine. The day has long since passed when the clinician was obliged to wait for the development of the well-known triad of symptoms and signs designating increased intracranial pressure (i.e., headache, vomiting, and choked disks) before he was justified in making a diagnosis of brain tumor. Today it is common knowledge that many patients harboring an intracranial neoplasm in any of a number of loci in the brain may complain of only slight headache, and it is widely appreciated by neurologists and neuro-surgeons that, in 15 per cent or more of any large series of patients with verified brain tumors, there is no appreciable choking of the disks at any stage of the disease, except, perhaps, as a quite terminal event.

The advent and utilization of the X-ray, the appreciation of the value of accurate visual fields for the detection of certain intracranial tumors in their early stages so clearly described by Cushing and his co-workers in a large series of papers, the judicious use of the caloric tests and the audiogram, and, in particular, the fundamental contribution of Dandy[1] who first proposed, in 1918, the deliberate introduction of air into the cerebral ventricles (ventriculography) for exact localization in patients who were probably harboring tumors or other surgical lesions, all aided, immeasurably, the real task of the neurosurgeon with respect to intracranial mass lesions, namely, that they must be detected unequivocally or at least definitely suspected at a reasonably early stage to allow of operative attack before irreparable damage has been done to important areas of the brain and before advanced pressure symptoms have developed which may well prevent a successful outcome. Coleman[2] states that the localization of brain tumors by the injection of air into the ventricles is a most important contribution to the surgery of brain tumor and has given to the diagnosis of these lesions a certainty which could probably never have been approached by clinical study alone.

However, even more recently than the diagnostic aids just mentioned, have come other important contributions, particularly in the pathological field. Cushing and Eisenhardt,[3] for example, have shown, in the illuminating account of their series of meningiomas, that these tumors are not all of a *benign* nature, as contrasted with the gliomas, and that careful analysis of the histological appearance of the removed tumor is the all-important factor in the case, particularly when prognosis and future methods of therapy are concerned. Occasionally, a tumor of this type, grossly benign, is frankly malignant on histological examination. Other workers have contributed valuable pathological studies, helping to clarify our ideas concerning the pathological types and behavior of intracranial tumors.

It is not only with the thought of presenting five *unusual* instances of brain tumor seen in our Clinic in the last four and one-half years (of interest from a pathological or diagnostic standpoint, as the individual case will demonstrate) that this report has been prepared, but also to re-emphasize the great importance of the *proper correlation and interpretation of all available data* in any individual case—the sum total of clinical, laboratory, surgical and pathological information which should result in a higher percentage of cures and, at the same time, undoubtedly aid in the advancement of our knowledge of the

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symptomatology, pathogenesis and life history of intracranial tumors as a whole.

Case I: A twelve-year-old white school girl with morning headache, vomiting and choked disks. Probable cerebellar or third ventricular tumor. Appendectomy averted by discovery of papilledema. Ventriculogram disclosed undoubted posterior fossa lesion. Suboccipital craniectomy performed: a solid circumscribed glioma (ependymoma) removed except for tiny nubbin of attachment to medulla oblongata; post-operative x-ray treatment. No evidence of recurrence four years after operation.

M. B. (University of Virginia Hospital No. 128312) was admitted on December 13, 1936, complaining chiefly of periodic morning headache and vomiting.

Ten months before admission headache and vomiting first developed. These symptoms recurred at intervals; the headache was always relieved by vomiting. Diplopia was noticed five months before admission.

It is of interest that four and one-half months before her present admission, she had been admitted to the surgical service with a tentative diagnosis of subacute appendicitis; the history was quite suggestive of such a lesion. However, she also had headache and the surgical interne (Dr. Ferguson) detected choked disks at that time; this finding first suggested that the periodic gastric disturbances were probably primarily intracranial in origin.

For several weeks before admission, there had been an increase in the headache, which was located anteriorly over the forehead. Slight ataxia and a tendency to drop objects from her hands had developed. There was no subjective visual failure.

Examination: Temp. 98.6°, Pulse 88/M, Resp. 20/M, B. P. 114/78.

She was very cooperative and well-oriented. The pupils were widely dilated but reacted well to light and accommodation. There was a bilateral choked disk of 4 or 5D; little or no nystagmus was observed.

She fell backward in the Romberg position. There was definite ataxia bilaterally and adiadokokinesia was present.

*Laboratory Finding:** The spinal fluid protein, determined on a previous hospital stay (August, 1936), had been 191 mgm.%. The visual acuity and fields were normal. Skull x-rays showed marked separation of the suture lines.

The *pre-operative diagnoses* were: (1) posterior fossa (cerebellar) tumor or (2) third ventricular tumor (in view of the intermittent symptoms). A ventriculogram was advised.

Operation: This disclosed (December 16, 1936) generalized ventricular dilatation. A suboccipital craniectomy was performed immediately (avertin-ether anesthesia).

*In this patient, as well as in the four other cases, the blood count and urinalysis were normal and the blood and spinal fluid (if examined) Wassermann reactions were negative unless otherwise specified.

An extract from the operative note reads: "The dura over the cerebellum, when first exposed, was very tense. This was relieved by tapping both lateral ventricles. The dura was then opened widely and in the posterior portion of the fourth ventricle (calamus scriptorius) the tumor could be seen immediately (Fig. 1). It was a large reddish gray, fairly well-outlined lesion, obviously a glioma, extending well below the atlas, a laminectomy of which was necessary for complete exposure of the neoplasm. The growth could be easily circumscribed with a blunt instrument and was removed *in toto* with the aid of silk traction sutures except for its small (0.5 cm.) attachment to the medulla, excision of which might have resulted in permanent impairment of vagal

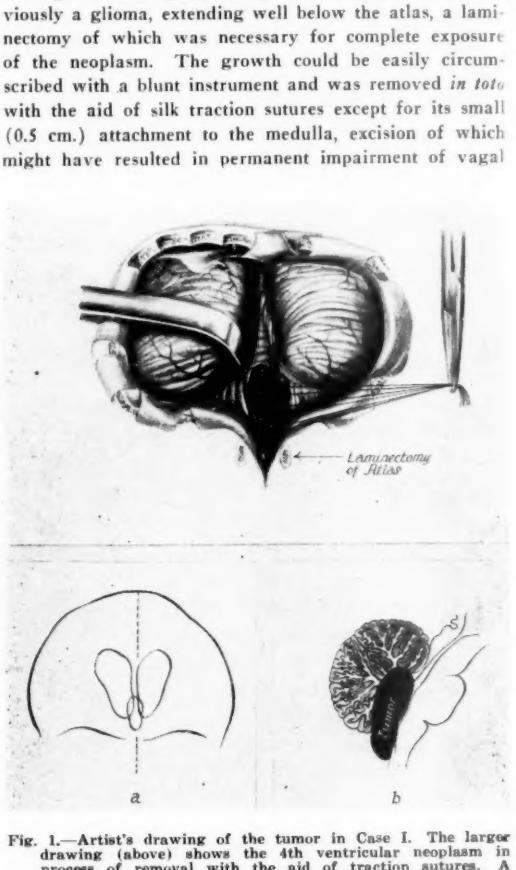

Fig. 1.—Artist's drawing of the tumor in Case I. The larger drawing (above) shows the 4th ventricular neoplasm in process of removal with the aid of traction sutures. A laminectomy of the atlas was necessary properly to expose the glioma without injury to the underlying medulla oblongata. Inset (a) is a diagrammatic sketch of the A-P ventriculogram view demonstrating typical symmetrical dilatation of both lateral and the third ventricles. Inset (b) demonstrates the position of the tumor in relation to the underlying brain stem and the overlying cerebellum.

functions. Following the removal of the tumor, the smooth glistening ependymal lining of the fourth ventricle was then seen and the ventricular system was completely unblocked."

The *histologic diagnosis* of the tumor (Dr. James Cash) was *ependymoma.*

Post-Operative Course and Follow-Up Notes: Her immediate post-operative condition was rather precarious. The temperature ranged from 100° to 104° for a few days but this was controlled by lumbar punctures. Dysarthria and dysphagia were fairly marked; the latter

necessitated nasal tube feedings. These developments (particularly the hyperthermia) were doubtless due—in part—to the wide opening of the fourth ventricle in the course of the removal of the tumor. The patient was discharged in good condition on January 9, 1937, and she received intensive x-ray therapy during the ensuing year. When last examined (December, 1940) four years after operation, there was no sign of recurrence and she was progressing well at school. The fundi and vision were normal.

Discussion: Spontaneous morning vomiting, particularly in children, whether associated with headache or not, demands an immediate inspection of the optic fundi and, in fact, a complete neurological examination in search of an intracranial tumor (frequently in the posterior fossa). There may be no subjective visual impairment, even though choked disks are present, a fact well-known to ophthalmologists. If not relieved promptly, the choking will inevitably produce secondary optic atrophy with resultant blindness; a rather sudden loss of vision, perhaps in a few days, is not rare in such cases. Nothing is more tragic than to see a patient who has had an intracranial tumor completely removed but who is blind or practically so because operation, for one reason or another, was not performed in time to preserve vision.

Ependymomas quite occasionally occur in the cerebellum in children. Cushing[4] has stated that they are most frequently found, as in this patient, in the posterior fossa. All such tumors reported by Bailey, Buchanan and Bucy[5] in patients less than sixteen years of age were in the fourth ventricle. Ford[6] observed that ependymomas may also occur in the lateral and third ventricles. He also significantly stated that, when situated within the fourth ventricle, the operation is very hazardous.

These tumors grow slowly, producing symptoms of cerebellar involvement and of increased intracranial pressure. Fincher and Coon[7] emphasized the occasional finding of calcified areas in posterior fossa ependymomas.

Bailey[8] summed up the important points succinctly in regard to childhood vomiting by stating "The vomiting of tumor occurs intermittently. A child who has vomited may be fed immediately afterwards. Such vomiting is often forceful and there may be intense nausea. I have seen two children with cerebellar tumors who vomited so constantly with such abdominal distress that they were treated for weeks by well-trained pediatricians for cyclic vomiting." Bailey[9] also asserted "The young physician should acquire an ophthalmoscope as early as a stethoscope and learn to use it as well."

Case II: A twenty-eight-year-old white miller with long-standing attacks of narcolepsy (?) developed severe morning headache, vomiting and diplopia, four months before admission. No choked disks. Ventriculogram showed a posterior fossa tumor; a large solid glioma (ependymoma) completely filling the fourth ventricle was subtotally removed. Post-operative recovery, followed by x-ray therapy.

Mr. A. L. (University of Virginia Hospital No. 139707) was admitted on June 15, 1938, complaining chiefly of severe morning headache, vomiting and ataxia.

He had been treated previously for peculiar attacks of five years' duration: he was suddenly unable to move any extremity although he did not lose consciousness, but felt unusually drowsy at the time. He had been taking benzedrine or ephedrine daily for several years as the attacks resembled a form of narcolepsy. There was also a history of vascular hypotension.

However, about four months before admission, he developed an entirely different symptomatology: vertigo, severe morning headache with vomiting, ataxia and diplopia.

Examination: Temp. 98.2°, Pulse 58/M, Resp. 16/M, B. P. 86/54.

He was conscious and cooperative. There was marked suboccipital tenderness on palpation. The fundi appeared normal, except for slight haziness of the right disk. There was marked nystagmus.

He swayed generally in the Romberg position and there was definite ataxia of the legs.

Laboratory Findings: Skull x-rays, caloric tests and eye examination were normal.

The *pre-operative diagnosis* was a posterior fossa tumor with the possibility that it might be multiple sclerosis, if the ventriculogram proved to be normal.

Operation: A ventriculogram (June 22, 1938) showed a symmetrical ventricular dilatation, including the third ventricle. A suboccipital craniectomy was performed immediately (avertin-ether anesthesia).

An extract from the operative note reads: "The occipital bone was very thin and the dura, when exposed, was under great tension. The left lateral ventricle was tapped several times during the operation. Even with this aid, the cerebellar cortex tended to protrude markedly through the dura, which was, therefore, opened at first for only 2 to 3 cms. over each hemisphere. Cerebellar tissue was aspirated away until the intradural tension was relieved. As the dura was reflected posteriorly, the neoplasm was apparent: a large solid whitish-gray glioma extending not only to the posterior portion of the fourth ventricle (calamus scriptorius) but beneath the atlas as well. The tumor appeared to fill the fourth ventricle entirely. It was not very vascular and could be circumscribed easily with a sharp dissector although it was adherent to the medulla oblongata

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(Fig. 2). With the aid of suction and pituitary scoops, most of the tumor was removed except for its attachment. All intradural tension was thereby relieved, the cerebellum pulsated normally and fluid and air could be seen coming down through the iter into the fourth ventricle. At the close of the operation the patient was conscious and talking rationally, with little or no dysarthria or dysphagia.

The *histological diagnosis* of the tumor (Dr. C. R. Tuthill) was *ependymoma.*

Post-Operative Course and Follow-Up Notes: Recovery was uneventful. X-ray therapy was given (July, 1938).

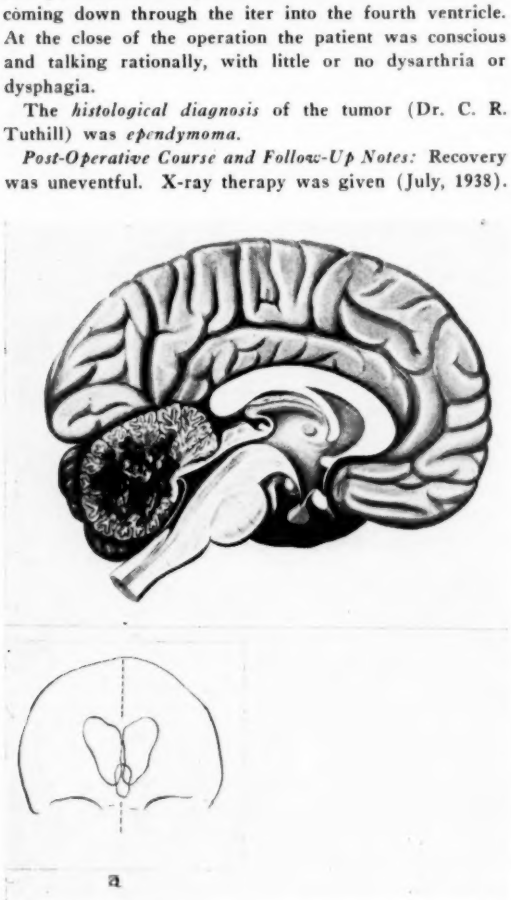

Fig. 2.—Case II. Artist's drawing of imaginary lateral view of brain to demonstrate complete occlusion of fourth ventricle by midline cerebellar tumor (4th ventricle was also entirely filled with tumor (see text) although not shown in this drawing). Inset (a) shows the typical internal hydrocephalus (A-P ventriculogram) seen with such a tumor, *although the optic disks were normal in this case.*

When last seen on June 26, 1940, two years after operation, the suboccipital decompression was under no tension and there were no signs of recurrence. He has returned to his work in the mill.

Discussion: The original symptoms of narcolepsy (?) were confusing in view of the subsequent development of a cerebellar tumor.

Another unusual feature of this case was the presence of a large solid glioma (ependymoma) completely filling the fourth ventricle to the extent of producing marked internal hydrocephalus (Fig. 2a), but with *normal eye grounds.* Cushing[4] recorded an exactly similar case in which headache, vomiting, unsteadiness and a supposedly Parkinsonian appearance developed. A cerebellar tumor was considered possible by the internists who first saw the patient but an alcoholic toxemia or a post-encephalitic syndrome was a more probable diagnosis, as the eye grounds were normal. A ventriculogram was performed which showed greatly dilated ventricles and an immediate cerebellar exploration disclosed a large, solid ependymoma apparently filling the entire fourth ventricle. The photographs accompanying Cushing's case show it to have been very similar to that in Case I of this paper.

Accumulation of cases such as these—and they can doubtless be duplicated in other neuro-surgical clinics—requires revision of our concepts of cerebellar tumor symptomatology. It used to be thought that posterior fossa tumors, as a group, invariably produced a greater or lesser degree of choked disks by occlusion of the aqueduct of Sylvius or the fourth ventricle. It is now known that cerebello-pontine angle tumors (also in the posterior fossa) not infrequently attain a large size without the development of papilledema or even internal hydrocephalus, but this is more understandable as they are *eccentrically* located with respect to the midline ventricular system. However, when the tumor is in the midline, completely filling the fourth ventricle and producing an enormous internal hydrocephalus, but no papilledema, as in Case II herein reported and in Cushing's case just cited, it is indeed unusual and demands a reconsideration of the pathogenesis of choked disks.

This case also demonstrates the value of ventriculography in borderline neurosurgical cases, from a clinical standpoint. Horrax[10] emphasizes the importance of cerebral air studies in the differentiation of brain tumor from intracranial vascular disease and the writer[11] has recently reported a series of cases demonstrating its value in: (a) psychiatric cases, (b) cerebral vascular lesions, (c) post-traumatic sequelae, (d) arachnoiditis, and (e) epilepsy.

The necessity for reduction of *intradural tension before opening the dura widely* in brain tumor operations cannot be over-emphasized. Not to do so invites disaster due to rupture of the brain cortex, serious or uncontrollable hemorrhage and damage to important, even vital, nervous structures. This techni-

cal procedure has been recently (1939) emphasized in a paper by Crutchfield and the writer.[12]

Case III: A thirty-nine year old white housewife with headache and astereognosis of the right hand. Examination elsewhere disclosed bilateral cervical ribs, considered to be probable cause of patient's complaints. No signs of increased intracranial pressure. Spinal fluid pressure normal (protein 50 mgm.%). Ventriculogram showed undoubted presence of left parietal tumor. Immediate craniotomy with complete removal of large meningioma. Recovery.

Mrs. M. P. (University of Virginia Hospital No. 148798) was admitted on May 12, 1939, complaining of headache and "numbness and weakness of the right hand of at least a year's duration." Occasionally, the right hand would "shake and quiver and feel quite cramped," but no grand mal seizure had ever occurred. She could not discern the nature of objects in the right hand. Headache was generalized and occasionally accompanied by nausea and vomiting. X-ray treatment (elsewhere) of the pituitary gland for presumed "menopausal headaches" had produced no relief.

Fig. 3—Case III. A-P ventriculogram in patient with a left parietal meningioma. The entire ventricular system is definitely displaced to the right and the left lateral ventricle is considerably flattened by pressure from above. The spinal fluid pressure was normal (135 mm. of water) and there was no papilledema. The arrows point to an enlarged diplopic vein in the vicinity of the tumor. The patient also happened to have bilateral cervical ribs of no clinical importance and complete astereognosis of the right hand.

Eleven months before admission, she had been studied extensively elsewhere and a diagnosis of bilateral cervical ribs (disclosed by x-ray examination) with pressure phenomena was made, although her complaints, even then, were numbness, tingling and occasional twitching of the right arm and hand. It was thought at that time that the patient did not have primary disease of the nervous system and postural correction, muscle stretching exercises, massage and local heat applications to the right arm were advised, without relief.

Examination: Temp. 98.8°, Pulse 96/M, Resp. 20/M, B. P. 168/100 (right), 170/100 (left).

She was quite conscious and rational. There was no choking of the optic disks.

There was complete astereognosis of the right hand with slight but definite spasticity of the fingers of that hand. The right elbow jerks were slightly exaggerated. A Hoffmann's sign was present on the right side and also a bilateral equivocal Babinski sign, more suggestive on the right side.

Laboratory Findings: The patient had slight anemia (Hb. 78%). Skull x-rays (May 12, 1939) disclosed definite enlargement of the normal vascular channels in the left parietal region. X-ray examination also showed a pair of cervical ribs.

An almost certain *pre-operative diagnosis* of left parietal meningioma was possible from the above data but because of the normal fundi and the normal spinal fluid pressure, a ventriculogram was recommended.

Operation: This showed (May 29, 1939) a pronounced shift of the ventricular system toward the right side (Fig. 3). Immediate craniotomy was performed (Dr. C. C. Coleman), under novocaine (1%) anesthesia.

An extract from the operative note reads: "The bone was very vascular. The dura oozed from innumerable points and underneath it could be palpated a large firm tumor. The large middle meningeal artery was occluded in the inferior portion of the exposed dura; this effectively controlled most of the dural bleeding. The dura was incised completely around the body of the tumor which was imbedded rather deeply in the left parietal lobe. The growth (with its dural attachment) was removed practically *in toto* from its bed. The dural defect was covered with a transplant from the adjacent temporal fascia. The entire bone flap was replaced as it was not invaded by the tumor".

The *histological diagnosis* of the tumor (Dr. J. R. Cash) was *meningioma* (Fig. 4).

Post-Operative Course and Follow-Up Notes: Recovery was uneventful. Weakness of the right hand was present for several weeks but this eventually improved very greatly. A dynamometer reading at the time of the last examination (April 27, 1940) was recorded as Right: 85, Left: 100. Complete astereognosis of the right hand has persisted to date. No grand mal seizures have occurred except on one occasion six months after operation (November, 1939) when she neglected to take the prescribed

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phenobarbital for three consecutive weeks. Her present condition is excellent.

Discussion: The points to be emphasized in this case are two:

(a) From a *diagnostic* standpoint the discovery of bilateral cervical ribs was completely misleading. The cervical rib or anterior scalene syndrome is of a *peripheral* type, causing weakness and atrophy of the lumbricales and interossei muscles of the affected hand, together with pain and (or) numbness, usually on the ulnar side of the hand, and diminished or absent elbow jerks and diminution or obliteration of the radial pulse. This patient had (on the other hand) as her chief neurological complaint (apart from headache which, in itself, should have suggested an intracranial lesion), *complete astereognosis of the right hand,* which is practically always of cerebral (cortical) origin, leading readily, in this instance, to a clinical diagnosis of a probable left cerebral tumor. The slight but significant elevation of spinal fluid protein (50 mgm. per cent) should be stressed. Patients from whom tumors have been removed in the vicinity of the cerebral motor areas should continue to take phenobarbital for an indefinite period thereafter to prevent convulsions.

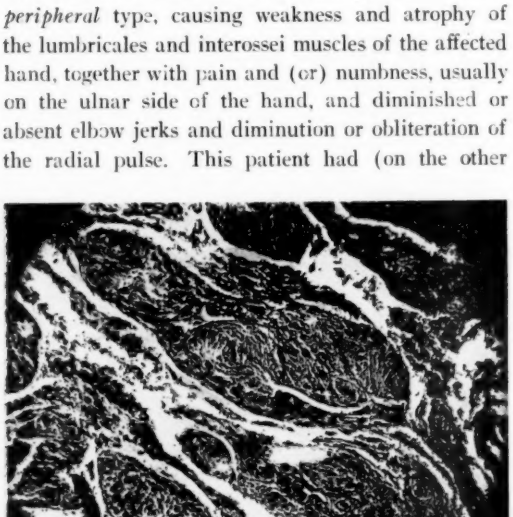

Fig. 4.—Microphotograph of tumor removed in Case III showing a benign meningothelial tumor with characteristic whorl formation. H. & E. stain x 95.

(b) There was nothing unusual about the *pathological* appearance of the tumor, either grossly or histologically: the common benign whorl-forming type of meningioma. As emphasized by Horrax[13] "The outlook for patients who have meningiomas *(of this histological type)** is most favorable." However, it is now known that the generic term "meningioma" includes a variety of neoplasms, practically all of which may appear grossly benign at an initial operation, but which may actually have highly malignant (sarcomatous) properties and recur rapidly. Cushing and Eisenhardt[3] have divided their series of verified meningiomas into nine main types. The tumor in Case III (just described) is typical of their Type I (of which there are four variants). That a meningioma may behave pathologically in an entirely different manner is clearly demonstrated by the following case:

Case IV: A twenty-three-year-old male bookkeeper with left-sided tinnitus (no deafness), bilateral choked disks, severe headache, haziness of vision and diplopia. Left occipital meningioma encountered in course of ventriculogram procedure. Tumor removed in toto except for tiny dural (sinus) attachment. Undoubted signs of recurrence two months later. Re-operation eight months after first operation for massive recurrence of malignant type of meningioma: subtotal tumor removal followed by x-ray therapy (two courses). Patient free of disabling symptoms thirty-nine months after second operation.

Mr. V. B. (University of Virginia Hospital No. 131847) was admitted to the service of Dr. D. C. Wilson on May 24, 1937, complaining of almost constant left-sided headache, tinnitus in the left ear and diplopia. The symptoms had begun with tinnitus six months previously. Severe headache had been present for six weeks although the diplopia was only of five days' duration.

A neuro-surgical consultation was requested.

Examination: Temp. 98.4°, Pulse 88/M, Resp. 18/M, B. P. 128/78.

His general condition was excellent. Pressure on the left occiput induced moderate tenderness. There was a bilateral choked disk (3-4D). Left abducens weakness was apparent as well as sustained nystagmus in looking to either side. Hearing was normal bilaterally. There was questionable ataxia of the left arm and leg.

Laboratory Findings: Skull x-rays (May 25, 1937) revealed marked erosion of the left petrous ridge. Visual fields (May 28, 1937) showed a questionable incomplete right homonymous hemianopsia, especially with the colored test objects. An audiogram was normal.

The *pre-operative diagnosis* was: cerebellar tumor giving rise to left cerebello-pontine angle symptoms. However, because of the equivocal cerebellar signs, the normal hearing and the questionable right homonymous hemianopsia, a ventriculogram was advised.

First Operation: (June 4, 1937; Dr. W. G. Crutchfield; 1 per cent novocaine anesthesia):

The ventricular needle, in passing through the left parieto-occipital region, encountered a firm mass at a depth of 3 to 4 cm.; the left lateral ventricle could not be reached. A left occipital bone flap was therefore immediately outlined. An extract from the operative note reads: "The dura was opened and the left occipital

*Parenthetic phrase inserted by the present writer.

cortex—under considerable pressure—was aspirated away, thus uncapping a firm red apparently benign tumor the size of a small orange attached rather firmly to the superior petrosal sinus and the left petrous bone. The growth (which did not invade the brain) was entirely removed except for a tiny (0.25 cm.) nubbin of tissue attached to the petrosal sinus."

The *histological diagnosis* was *meningioma* and a good prognosis was given.

Post-Operative Course: The patient made an excellent recovery; the headache and choked disks rapidly disappeared within three weeks' time. However, he was re-admitted four months later (October 16, 1937) with recurrence of headache (of two months' duration); the disk margins at this time were hazy. The spinal fluid pressure was 280 mm. of water. He was again admitted on January 27, 1938, about seven and one-half months after the first operation. The decompression was very tense even when he sat erect, severe headache was present and the choked disks had re-appeared (3D). Re-operation was advised.

Second Operation (February 8, 1938; J.M.M.): Under ether anesthesia, the old scalp flap was re-opened; the dura was 7 to 8 mm. in thickness. Under the dura was found an enormous solid very vascular undoubtedly malignant growth which was invading the brain. A frozen section biopsy (Dr. Page Newbill) was reported as a malignant meningioma; the neoplasm was subtotally removed. The patient was in good condition at the close of the operation.

The fixed sections of the *tissue removed* at the second operation showed (Dr. C. R. Tuthill) a *meningeal sarcoma* (Fig. 5).

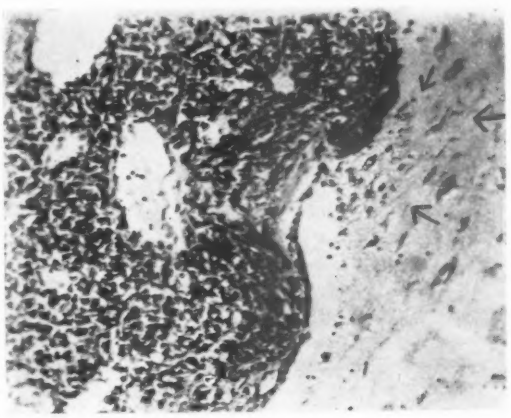

Fig. 5.—Microphotograph of tumor tissue removed at second operation in Case IV demonstrating a meningeal sarcoma with reticulin of polar cells surrounding round and oval cells in alveolar formation. Rupture of capsule and invasion of cortex seen at right (arrows). Toluidin blue stain x 120.

Present Status: Two courses of x-ray therapy were given after the second operation and he is now in excellent condition. The optic disks are normal and he is free of headache. A slight, almost imperceptible, sensory aphasia is present.

Discussion: This tumor was in an unusual location: attached to the basilar dura in the middle fossa and the superior petrosal sinus and simulated somewhat a cerebello-pontine angle syndrome. Horrax,[14] in his Clinical Lecture on "Meningiomas of the Brain" at the Annual Session (1938) of the American Medical Association, reported sixty personal cases, none of which were located in this region. By a fortunate circumstance, the exploring ventricular needle, intended for ventriculography at the time of the first operation, impinged on the tumor and immediate craniotomy enabled the operator to deal adequately with the growth.

However, the chief interest in this case centers on its *histological characteristics* and the importance of this in prognosis and future therapy.* The diagnosis of meningioma at the first operation, together with the fact that the tumor had been completely removed except for a tiny nubbin of attachment, led to a favorable prognosis and no X-ray therapy was given at that time. When undoubted clinical signs of recurrence developed within two months of the first operation, and a massive tumor with invasion of the brain itself (Fig. 5) was demonstrated at the second operation, it was apparent enough that a malignant growth was present. Scrutiny of the tissue removed at the second operation demonstrated a meningeal sarcoma, similar, in all respects, to the tumors of *mesodermal* origin reported by Bailey[15] and by Hsü[16] (from Bailey's Clinic) under the term "alveolar sarcoma". Bailey[17] believes that all tumors of this type arise from the leptomeninx or its derivatives and are exceedingly rare. This neoplasm is not to be confused with the old-time type of intracranial "sarcoma", which diagnosis was recorded frequently in the surgical and pathological literature of the last century; these latter tumors are now properly designated as glioblastoma or spongioblastoma multiforme and are of *ectodermal* origin. Such a case, then, provides an exception to Davis' statement[18] that

*Another case, possibly related to the meningiomas, and histologically malignant, has recently (December, 1939) been treated in our clinic: An adolescent boy, with severe right-sided Jacksonian convulsions, was found to have a large left cerebral cyst, the tumor nodule of which was not a glioma. The boy recovered post-operatively and has done well to date (May, 1941). The histological features of the tumor nodule which was removed *in toto*, are of such interest that they have been incorporated in a special report (now in preparation) of the case.

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meningiomas are benign growths which do not invade brain tissue but only involve it by pressure, and are, from that standpoint, the most favorable of all intracranial tumors for surgical attack. Horrax[19] states that the meningiomas may differ considerably in their histological picture. The tumor removed from this patient (Case IV) does not fall into any of the nine histological types designated by Cushing and Eisenhardt[3] following an analysis of their large series of verified meningiomas (306 cases). They believe,[20] however, that certain global meningiomas are actually sarcomatous from the beginning and that meningiomas rarely if ever change their histological types but that a given tumor, of sarcomatous nature, has been sarcomatous from the outset. They refer, however, to two cases (not of their own material) in which a sarcomatous transition (from an originally benign meningioma) appeared to have taken place, as in this patient (Case IV).

This neoplasm is identical with one of the four types of intracranial sarcoma previously cited by Hsü,[21] namely, the "alveolar sarcoma", the other three types being (a) sarcomatosis of the meninges, (b) fibrosarcoma and (c) perithelial sarcoma. Hsü's statement[22] in regard to intracranial sarcomas (malignant tumors of mesodermal origin) as a group may profitably be quoted: "all intracranial sarcomatous tumors are rapidly growing, with numerous mitotic figures, and, although they do not . . . , metastasize outside the intracranial cavity, they do spread widely along the leptomeningeal or perivascular spaces, are not encapsulated and are rapidly destructive to the neural parenchyma. Their rarity is doubtless exaggerated by the fact that they are not often diagnosed."

Case V: A twenty-eight-year-old white farmer with severe posterior headaches and vertigo. Left homonymous hemianopsia. Extensive calcification (x-ray) in right temporo-parietal region. Craniotomy disclosed unusual calcified lesions: true bone formation in and overlying the right cerebral hemisphere, which were removed in large part. Recovery. Disappearance of left homonymous hemianopsia.

Mr. J. T. (University of Virginia Hospital No. 143923) was admitted on October 28, 1938, complaining of severe headache and "eye trouble".

In June, 1936, he first became aware of headache chiefly in the occipital region. Vertigo also developed and persisted for several hours at a time. No convulsions had ever occurred. He had had difficulty with his eyes for many years, probably since birth, both in extra-ocular movements and in vision itself. Skull x-rays taken elsewhere ten days before admission showed extensive calcification in the right cerebral hemisphere. Two weeks previously the development of severe headache caused him to seek relief.

Examination: Temp. 98.6°, Pulse 72/M, Resp. 20/M, B. P. 132/78.

He was quite conscious and rational. No signs of increased intracranial pressure were present. There was tenderness over the skull posteriorly on deep pressure. The optic disks were well outlined. The left pupil was larger than the right and there was a paralysis of the right superior rectus muscle; the patient had congenital strabismus. The left biceps jerk was slightly exaggerated.

Laboratory Findings: Skull x-rays (October 28, 1938) showed a large number of irregular calcified masses of various sizes lying, apparently, near and (or) on the cerebral surface of the right temporo-parietal region (Fig. 6).

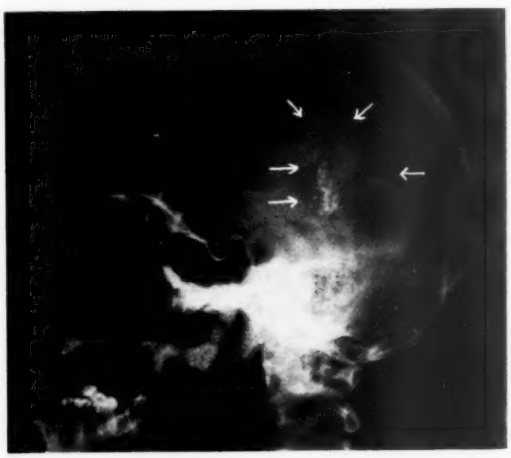

Fig. 6.—Case V. Right lateral x-ray view of skull demonstrating the extensive calcification in the right temporo-parietal region (arrows). The patient also had a left incomplete homonymous hemianopsia which disappeared after operation.

Visual fields (October 29, 1938) showed an acuity of 20/32 minus two in each eye and a definite incomplete left homonymous hemianopsia.

The *pre-operative diagnosis* was a right cerebral calcified lesion, possibly a hemiangioma or calcification in a glioma.

Operation: On November 1, 1938, a moderate sized right-sided bone flap was turned down, under avertin-ether anesthesia. An extract from the operative note reads: The bone was very vascular. The dura was at first rather tense but, on opening it inferiorly, a large amount of subarachnoid fluid escaped. Thereafter the hemisphere receded markedly from the under surface of the dura. There was no evidence of a hemiangioma and the recession of the hemisphere almost certainly eliminated the possibility of a glioma. A most unusual lesion was disclosed: large calcified bony plaques were found

lying on the surface of the cortex and imbedded in the brain itself. In addition, the subarachnoid space was seeded with innumerable tiny calcified masses (Fig. 7).

Fig. 7.—Case V. Artist's drawing of appearance of surface of brain as disclosed at operation. The (upper) spherical bony mass extended several cms. into the right temporal lobe and probably accounted for the left-sided incomplete hemianopsia. The (lower) flat bony plaque did not appreciably penetrate the brain. Innumerable tiny calcified masses are "seeded" over the surface of the brain in and beneath the arachnoid. There was no evidence of hemiangioma. Bacteriologic and pathologic examination of the removed osseous and calcified tissue demonstrated no tubercle bacilli. Inset (a) shows the approximate location of the bone flap.

Some of the larger masses were undoubtedly due to true bone formation and certain of them appeared caseous. All the larger plaques were removed, in particular a bony tumescence with a rough irregular surface that extended several centimeters into the temporal lobe and was probably the cause of the hemianopsia. These were sent to the pathological laboratory for histological study and to the bacteriology laboratory for guinea pig inoculation (tuberculosis?).

The *histological diagnosis* of the removed material was: *osseous tissue*, i.e., *true bone formation (osteoma)*. The guinea pigs inoculated with an emulsion of the calcified masses developed no tuberculosis and an acid-fast stain of this material revealed no tubercle bacilli.

Post-Operative Course and Follow-Up Notes: The patient's immediate recovery was entirely satisfactory. A lumber puncture performed on the tenth post-operative day showed a normal pressure (120 mm. of water); the fluid contained 10 mgm.% of protein and no cells. The spinal fluid phosphorus was 1.35 mgm.%, the calcium 4.5 mgm.% and the phosphatase 0.41 Bodansky units (normal).

All headache rapidly disappeared. Post-operative eye examination (November 12, 1938), made on the day before discharge, showed an acuity of 20/20 minus three on the right and 20/25 minus four on the left with full peripheral fields, i.e., the left homonymous hemianopsia had disappeared. He has continued to do well and is now engaged in heavy farm work.*

Discussion: In examining the pre-operative roentgenograms, it was thought that this patient possibly had a right cerebral angioma or one of the gliomas (oligodendroglioma, ependymoma, astrocytoma, etc.), although there were no clinical signs of increased intracranial pressure. Bailey[23] states: "the differential diagnosis of intracranial calcification is difficult. The only typical calcification occurs in the angioma, where parallel curved lines are distinctive. Even in this instance, confusion may arise with calcification in blood vessels of *normal* distribution. . . . When the calcification occurs near the inner table of the skull or near great dural septa one must be careful to differentiate it from that occurring in the meninges or in the rare calcification of meningeal tumors. Any slowly growing glioma may be calcified." Grinker[24] observes that diffuse calcification in various parts of the brain has been described in association with epilepsy. Normally, in adults, calcium deposition often is seen in the pineal body, the choroid plexus, the falx cerebri and occasionally in the meninges, as McKendree, Wortis and Soltz[25] point out, although such deposits would not explain the diffuse calcification visualized in this patient (Case V). They also emphasized that the absence of altered calcium metabolism elsewhere in the body (as in case V) and the normal content of calcium, phosphorus and phosphatase in the spinal fluid,

*This patient subsequently developed severe left-sided Jacksonian seizures with unconsciousness. He was reoperated on at the same site (November 14, 1940) and the right motor cortex was found to be extremely adherent to the dura. The adhesions were released, the dura left partly opened (decompression) and he is now free of convulsions.

indicate a *localized alteration* in the brain. The three cases of multiple intracerebral calcification (attributed to faulty calcium metabolism) reported by these writers were associated with paroxysmal convulsive disorders. Eaton and Haines[26] are familiar with seven cases of hypoparathyroid tetany in which post-mortem examination of the brain revealed extensive cerebral calcification, usually in the basal ganglia. Intracranial calcification in such patients is not particularly unusual, and is due, presumably, to altered calcium metabolism incident to hypoparathyroid tetany. However, the case (V) herein described showed no evidence of tetany.

Apart from these considerations and putting aside, for the moment, the possible physiologic-pathologic imbalance of calcium metabolism resulting in such extensive intracranial calcification as occurred in this patient (Case V), attention is directed to the possible histogenesis and relationship to tumor formation of such a lesion. Although not a case of tumor peculiar to the brain alone, the possibility that it was *neoplastic*, rather than due to altered calcium metabolism only, had to be definitely entertained. Undoubtedly the calcified masses removed at operation were examples of true bone formation (osteomata) and their possible source appeared to be of great interest, if only because of their rarity in such a location. Thin bony plaques are not infrequently found overlying the spinal cord when the dura is opened but they are much rarer intracranially; in fact, the lesion described in this patient was unique in the writer's experience.

In regard to the pathogenesis of true intracranial bone formation, it is of interest that Cushing and Weed,[27] in 1915, in reporting their studies on calcareous and osseous deposits in the arachnoidea, stated that "such calcareous deposits are associated with a hyperplasia of the arachnoidal mesothelium. The deposits of lime salts are apparently laid down in these cell bodies. The occurrence of true bone formation in the arachnoid of man should be regarded as a similar phenomenon, except that one may consider the process of ossification to be proliferative rather than degenerative. The so-called dural endotheliomas (meningiomas) show histologically the same cellular arrangements with calcium and osseous deposits that are commonly found in the arachnoid and therefore take their origin, in all probability, from the mesothelium of this membrane." This reasonable explanation of the probable identical origin of meningiomas, osteomas and calcareous deposits in the arachnoid is intriguing.

Finally, in discussing the anatomical source of the meningiomas, Cushing and Eisenhardt[28] refer to work with Weed in which the relationship of calcareous and osseous deposits in the arachnoid to meningeal tumors was pointed out, and they allude to other studies of the arachnoidal cell rests of the cat's meninges in which they observed gradation in advancing age from slight areas of thickening to actual tumefaction, interpreted as a phenomenon of senescence.

Certainly, the osseous lesions which developed in this patient (Case V) are closely related to the meningiomas, so far as their histogenesis is concerned. The case is an unusual illustration of a benign intracranial lesion which should always be included in the differential diagnosis of patients who present greater or lesser degrees of intracranial calcification.

SUMMARY

Five unusual cases of brain tumor are presented, some of them with reference to pitfalls in diagnosis which delayed operative relief; others, to emphasize that a realinement of pathological concepts of certain brain tumors is necessary, thus aiding, apart from academic interest alone, in the prognosis and future therapy of such cases. These cases are, in order:

I. A school girl developed morning headache and vomiting which resembled rather closely, at first, attacks of appendicitis. The finding of choked disks led to a practically complete operative removal of a cerebellar glioma (ependymoma).

II. A young miller had morning headache, vomiting and diplopia, but no choked disks. A ventriculogram demonstrated a posterior fossa glioma completely filling the fourth ventricle which was subtotally removed (ependymoma) and X-ray therapy was administered.

III. A housewife complained of headache and astereognosis with clonic twitching of the right hand. Bilateral cervical ribs were demonstrated (X-ray), an incidental finding, which delayed diagnosis of a left cerebral meningioma. The tumor was completely removed.

IV. A young bookkeeper observed left-sided tinnitus as an initial symptom; severe headache, diplopia and choked disks developed: a left cerebral meningioma was removed and a good prognosis

given. Signs of recurrence developed within two months and, eight months later, re-operation demonstrated massive (sarcomatous) infiltration of the brain at the site of the original meningioma. X-ray treatment was given after subtotal removal of the tumor (second operation). This case demonstrates the great importance of very careful histological scrutiny of all meningiomas, as certain of them are now known to be as malignant as the gliomas, if not more so.

V. A young farmer complained of severe headache and vertigo with inability to see toward his left side. Extensive calcification (X-ray) was discovered in the right cerebral hemisphere which proved, at operation, to be due to true bone formation (osteomata), closely related (histogenetically) to the meningiomata.

These patients are presented with the thought that the information imparted by them may definitely aid us in (1) the *earlier correct diagnosis* of patients who are harboring brain tumors, and thus lead to their relief before irreparable damage has been done to important or even vital nervous structures, and (2) appreciation of the necessity for *close histological scrutiny*, especially of apparently benign intracranial tumors (grossly), in order to avoid errors in prognosis and future therapy.

NOTE: The writer wishes gratefully to acknowledge the aid of the Departments of Roentgenology and Pathology at the University of Virginia in the interpretation of the x-ray films and of the histological sections, respectively, of the five cases herein reported.

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XUM

DIAGNOSIS AND SELECTION OF TREATMENT FOR CARCINOMA OF THE LARYNX.*

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The high mortality of laryngeal malignancy is a challenge to the physician. In spite of the large amount of missionary work that has been done, little effect has been noted in the field of early laryngeal diagnosis. Carcinoma of the larynx is usually one hundred per cent fatal if it is diagnosed late. Yet, early intrinsic carcinoma of the larynx is more amenable to surgery than a similar lesion located in most any other organ of the body.

Carcinoma of the larynx makes up about four per cent of all malignant tumors of the body, and about sixteen per cent of all tumors of the larynx. The sex ratio shows ninety per cent occurrence in the male, to ten per cent in the female, while the race incidence in this country is ninety-eight per cent in the white, to two per cent in the negro.

There is fundamentally no more known about the cause of laryngeal malignancy than is about the cause of this lesion elsewhere in the body; however, the role of vocal abuse, smoking, and inhalation of tar dust, has been advocated and disputed by authorities of equal importance. We are certain of one fact, however, and that is, malignancy of the respiratory tract is attracting more and more attention, with greater enthusiasm each year.

Early recognition of malignancy of the body is always an important feature in the patient's recovery, though in many organs of the body, early recognition is frequently impossible. On the contrary, the interior of the larynx offers an exceptional opportunity to recognize lesions early, because the thick cartilaginous box acts as a barrier to extension, and because the lymphatic system supplying the vocal cord region of the larynx is extremely meager. Recognizing these facts as common knowledge, why is it then that malignancy of the vocal cord is not diagnosed sufficiently early to justify a conservative operation? There are mainly two reasons for this: (1) approximately eighty per cent of all laryngeal carcinomas involve the vocal cords first and, as hoarseness is the only symptom produced at this stage of the lesion, the patient is frequently reluctant to seek early medical aid for what he thinks is a simple laryngitis or some other trivial condition; and (2), failure on the part of the physician always, to regard a patient with hoarseness as a cancer suspect, and to examine the larynx in detail when first consulted.

Jackson has stated, that in patients with carcinoma of the larynx examined by him, only twenty per cent of the total number were suitable for a conservative laryngofissure operation. This statement justifies the assumption that eighty per cent of the cases examined by him were either classed as inoperable or only suitable for a total laryngectomy. This does not necessarily mean that every patient with laryngeal malignancy, whose condition is recognized early, is suitable for laryngofissure operation, because there are certain instances (approximately twenty per cent) in which the lesion is not intrinsic in origin and therefore is unsuitable for such an operation.

Mirror examination of every patient manifesting hoarseness, or slight throat discomfort, would go a long way in recognizing early lesions which could be further studied by direct laryngoscopy and biopsy. This examination is quite simple, though important; yet, it would seem that it is greatly overlooked in the teaching of undergraduate medical students and internes.

Direct laryngoscopy is a more formidable procedure, requiring the use of an operating table, and, in adults, usually some form of local anesthesia. This particular examination is indicated in every case when malignant disease is suspected by mirror examination. This procedure enables one to inspect the deeper portion of the larynx, gives a better view of the posterior laryngeal wall, and aids in instrumental palpation of the lesion. These features are frequently necessary adjuncts to mirror examination.

BIOPSY

The importance of an early biopsy in a suspected malignancy is generally admitted. Postponing this procedure in an effort to make a diagnosis with

*Read before the Richmond Academy of Medicine, Richmond, Va., February 25, 1941, and with slight changes before the Virginia Society of Ophthalmology and Otolaryngology, May 10, 1941.

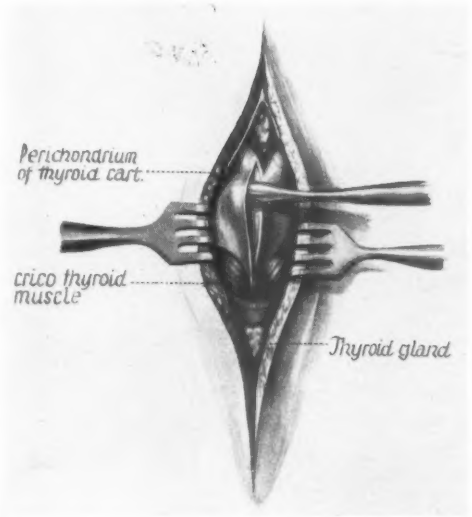

Fig. 1.—Initial incision for close dissection laryngectomy. Instrument shows separation of perichondrium from thyroid cartilage.

mirror examination, by watching the progress of a questionable lesion, is a fallacy that may cost a larnyx with serious regret. Biopsy of a non-malignant growth in the larynx will not cause it to become cancerous. It will neither disseminate cancer in the larynx when it already exists, nor will it cause metastasis. However, in event an operation is necessary, it is usually better not to delay operation following biopsy. Removal of tissue from the vocal cord should be done with great care and with due regard for securing some of the basal lesion, and,

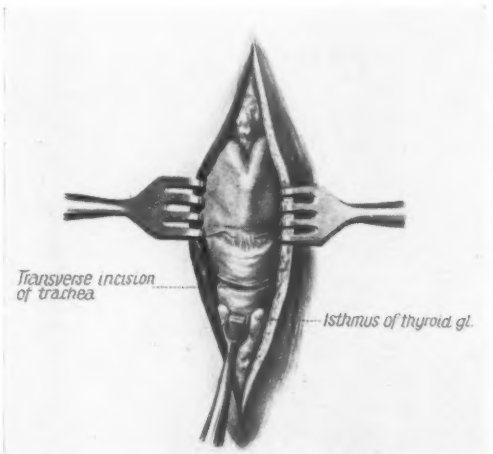

Fig. 2.—Shows anterior and lateral regions of larynx skeletonized.

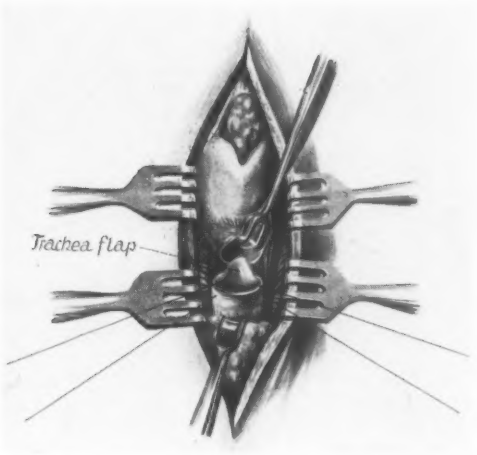

Fig. 3.—Shows larynx severed from first ring of trachea.

when favorable, a portion of normal adjacent tissue should be used for contrast study. In event the histologic report happens to be negative in the face of clinical evidence of malignancy, there should be no hesitancy in repeating the biopsy once or even twice before excluding this disease. If the lesion is large enough to justify the removal of two portions of tissue from different areas of the same growth, this should be done for better histologic grading. Exploratory operation has no place in the diagnosis

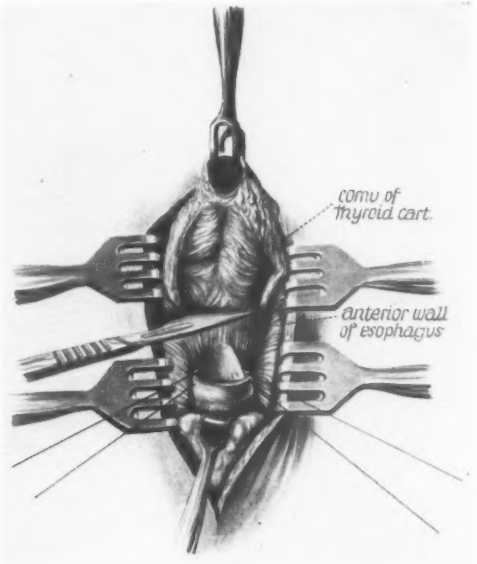

Fig. 4.—Dissecting larynx from esophagus.

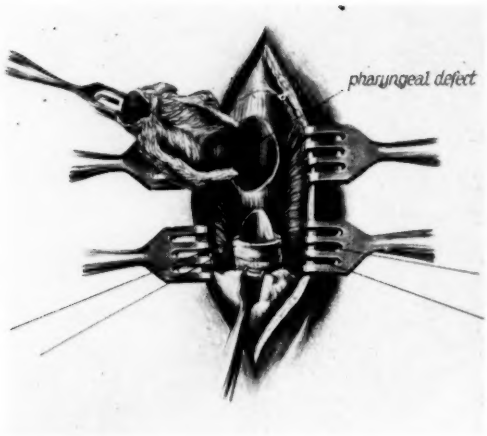

Fig. 5.—Laryngeal dissection completed, showing opening of hypopharynx.

of carcimona of the larynx. Direct laryngoscopy and biopsy have made this procedure obsolete.

SELECTION OF TREATMENT

There are three methods of treatment for laryngeal carcinoma, namely, laryngofissure operation, total laryngectomy, and radiotherapy. Each method has its indications, though not always well defined. In the main, after giving due consideration to age and general physical condition, there are three important factors which should determine the selection of treatment: (1) the exact location of the growth, whether it is extrinsic or intrinsic; (2) the extent or stage of the lesion, and (3), the degree of malignancy.

Fig. 6.—Method of suturing hypopharyngeal defect. Feeding tube shown *in situ*.

Fig. 7.—Operation complete.

It is not within the scope of this paper to discuss the finer details pertaining to these three findings, though it is desirable that they be enlarged upon in a general way.

The anatomic classification of intrinsic and extrinsic lesions of the larynx is not definitely settled; however, it is generally recognized that if a lesion is situated above the ventricular band, or so-called false cord, it is considered "extrinsic", and if the lesion is located below this area it may be classed as "intrinsic".

Having classified the location of the lesion, one must then estimate the extent or stage of the growth.

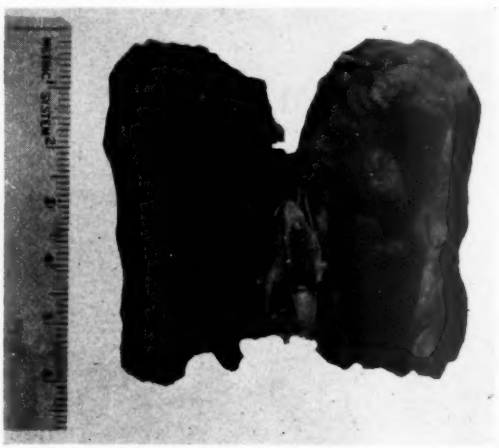

Fig. 8.—Interior view of larynx after removal, showing bilateral papillary carcinoma.

Fig. 9.—Larynx removed, showing carcinoma of subglottic region on both sides.

Fig. 11.—Interior of larynx removed, showing carcinoma involving left cord and subglottic region.

This can not always be done with the laryngeal mirror. Direct inspection is frequently necessary before proper evaluation can be made.

According to many pathologists, cell grading is largely arbitrary; the same growth may demonstrate grade two in one area of the lesion, and grade three or four in another area. It is also stated that the same growth may show a different grade of cells at one period, and that another grade of cells may be demonstrated at a later period. For these reasons some clinicians are little influenced by the grading report in the management of laryngeal malignancy.

LARYNGOFISSURE

In brief, this operation is chiefly indicated in patients with laryngeal malignancy when the lesion is confined to the anterior one-half of a vocal cord, or to the anterior third of both cords. A lesion of a cord advanced sufficiently to involve the arytenoid joint is usually unsuitable for this operation, yet there are some finer decisions that may be made between these invaded areas in certain cases, which time will not permit discussing at this moment.

As a rule, a lesion situated in the confines suitable for a laryngofissure operation is, in the large majority of instances, grade one or two. This type of growth is not highly malignant, it extends slowly, and it rarely invades the lymphatics early. This operation merits few immediate hazards. In eighty per cent of properly selected patients, it will save life and leave a voice rarely impaired beyond a rough hoarseness. This procedure consists of approaching the larynx through a mid-line incision of the neck, and splitting the thyroid cartilage with specially devised shears, or a motor driven saw, depending upon the degree of ossification of the cartilage, and

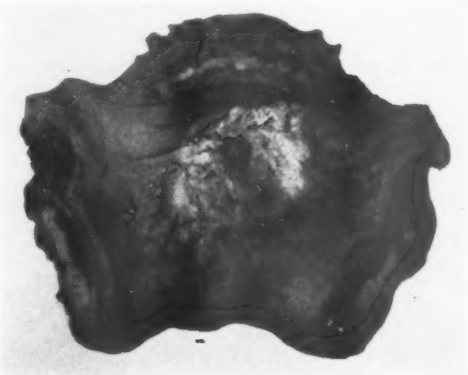

Fig. 10.—Larynx removed, showing carcinoma, grade 2. Extensive invasion of anterior commissure.

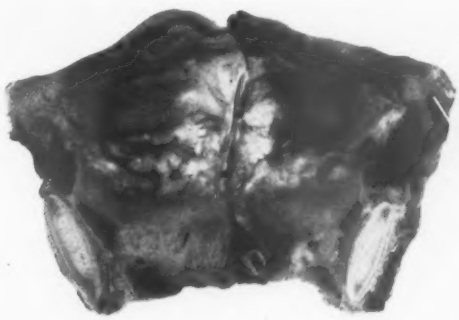

Fig. 12.—Larynx removed, showing polypoid carcinoma of grade 2, involving both vocal cords.

XUM

location of the growth. The lesion including the cord is removed by subperichondrial dissection, taking pains to get well beyond the margin of growth. Some operators prefer a pre-operative tracheotomy, whereas others deem this unnecessary. The external wound is usually healed in a week, though it may require four to six weeks for complete epithelization of the inner surface.

LARYNGECTOMY

Total extirpation of the larynx is attended by less serious complications than formerly. Preoperative attention to oral and nasal infections, improved surgical technic, and meticulous post-operative care should be given credit for this.

Laryngectomy is indicated in cases presenting intrinsic lesions too far advanced to risk a laryngofissure operation, and in selected extrinsic lesion. Here again, in each given case one has to estimate the extent, location, and cell grading, before making a definite decision. However, as long as the growth is confined to the inner laryngeal box, regardless of the degree of malignancy, a close dissecting type of laryngectomy is the method of choice. Early extrinsic lesions, before metastasis has taken place, are frequently good risks for a wide dissection operation. Extrinsic lesions, moderately advanced, which are highly malignant, are probably unsuitable for any type of laryngectomy. Extrinsic lesions with glandular involvement should be considered inoperable.

Laryngectomy may be done in either one or two stages, however the former is the one chiefly practiced today. Avertin and ether may be used, though many operators prefer infiltration anesthesia.

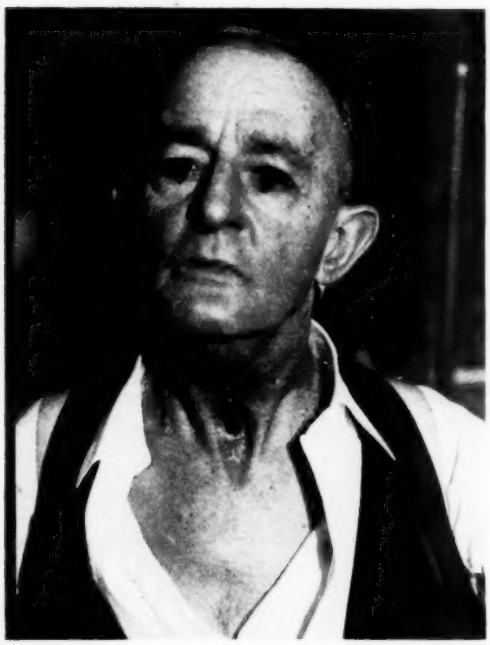

Fig. 13.—Post-operative wound, showing large tracheal opening, three months after operation. Use of laryngectomy tube unnecessary.

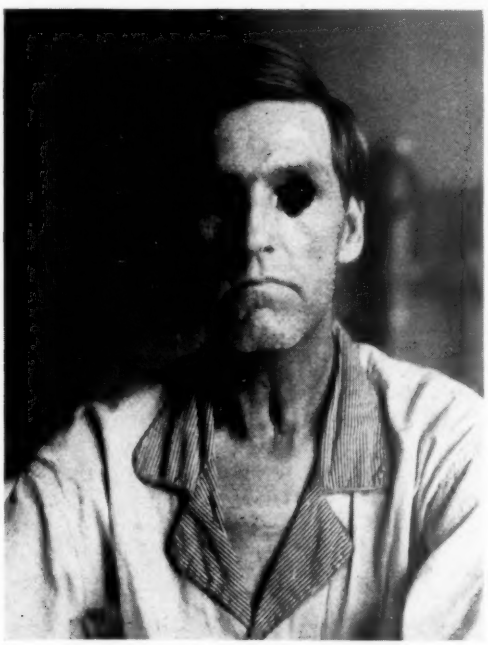

Fig. 14.—Appearance of wound eight weeks after laryngectomy, narrow tracheal opening requiring use of laryngectomy tube.

The technic consists mainly of a single mid-line incision, instead of the T-shaped flap pattern, which was once so popular. The hyoid bone is not removed unless a wide dissection is required. It is thought best to avoid this when feasible, because the muscle structure of the neck is less disturbed and a better reinforced pharyngeal closure can be made with the ribbon muscles. The subperichondrial stripping after the method of Crowe and Broyles, and the preservation of a tracheal flap when practicable, are refinements which tend to lessen a possible pharyngeal fistula. A narrow mid-line opening and close dissection are advantageous in the prevention

of shock, trauma, and retarded healing. However, in event the lesion is extrinsic either by extension or origin a wider dissection operation is often necessary.

The immediate post-operative care of a larngectomized patent is almost as important as the technic of the operation. Specialized nursing is essential and the nurse should be made to realize the importance of her part in the patient's recovery. The physician should not relegate the dressings or other

Fig. 15.—This patient preferred the use of an artificial larynx.

details to the resident. The tracheal tube must be kept clear at all times, and the abundant secretions must not be allowed to enter the lungs any more than possible. Concentrated liquids are given at intervals or by the drop method through the feeding tube. On account of the cough reflex, opiates should be strictly forbidden.

IRRADIATION

Until we have better criteria, the use of radiation therapy for laryngeal malignancy should be based upon the following findings: the location of the lesion; the fixation of the invaded tissues; and the histologic cell grading.

Coutard divides cancer cells into two main groups, namely, differentiated and undifferentiated. He states, "cancers composed of undifferentiated cells are treated successfully by radiation. Because of their tendency to disseminate, they are not biologically operable." He also states, "cancers composed of differentiated cells are in the domain of surgery, and usually are not curable by radiation because of the intimate connection between muscle cells and carcinoma cells."

In reviewing the literature, there seems to be a marked difference of opinion as to the relationship between histologic structure of the lesion and radiosensitivity. Cutler states, "Since the property of radiosensitivity is a matter of degree and is so intimately related to the efficiency of treatment, it is impossible to draw a fine line of division between radiosensitive and radioresistant tumor."

An intrinsic lesion invading the muscle structure with fixation is readily sterilized by irradiation without permanent damage to the surrounding normal tissue.

Carcinoma of the extrinsic larynx of grade four is usually more suitable for irradiation. However, when there are instances in which surgery is justifiable, irradiation should be used as an adjunct.

High grade lesions, manifesting cervical metastasis, should be treated by irradiation alone. Low grade intrinsic lesions, with cervical involvement, are usually inoperable, though surgical measure may be tried in conjunction with irradiation.

Professional Building.

INTESTINAL IMPLANTATION WITH LACTOBACILLUS ACIDOPHILUS BY THE USE OF BACILLUS ACIDOPHILUS MILK.*

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Roanoke, Virginia.

Ernst Moro, a German investigator, in 1900, described a distinctive Gram-positive bacillus as the predominating organism in the intestinal tract of milk-fed babies, which later was called bacillus acidophilus. He also claimed this to be the most prevalent organism in the stools of breast-fed infants. This, however, proved to be untrue, as the claim, in the same year, of Tissier, a Frenchman, that his bacillus bifidus was the predominating organism in breast-fed babies, was confirmed by Cahn, Tissini, Jacobson, and others, and admitted later by Moro.

The bacillus bifidus is the first bacterial implantation of the intestinal tract following birth. The tract prior to birth is sterile. This organism can be grown within four to six hours after birth, and increases rapidly in concentration as full breast feeding is developed. It continues to be the predominating organism until ordinary milk, prepared milk, and mixed diets come into use; then a predominance of lactobacillus acidophilus, which is the new genus for the originally named bacillus acidophilus of Moro, comes into being.

The study of the influence of diet on the bacterial content of the intestinal tract has interested bacteriologists since the earliest days of the science. It is generally agreed that the bacterial flora of childrens' intestines changes as their diet changes. It is also agreed that the intestinal flora of adults may be altered as a result of feeding, but it has not been possible except in rare instances to establish satisfactorily an acidophilic flora by diet alone.

Because of an observation on the part of some of the earliest workers in bacteriology, that there was a mutual antagonism between many acid-producing bacteria and the putrefactive ones, it was suggested first by Escherich, in 1887, that possibly intestinal putrefaction could be combated by adding acid-forming bacteria in conjunction with carbohydrates to the diet of those who suffered from the condition. He proposed, in this way, the use of bacillus lactis aërogenes. Quincke, in 1898, suggested in a similar way the use of yeasts—odium lactis. In 1900, Brudzinski obtained favorable results by feeding to infants suffering with fetid diarrhea pure cultures of bacillus lactis aërogenes. Metchnikoff, in 1906, felt that much of the failures of therapy were due to the insufficient powers to produce acid by the germs which had been previously used and, in searching for more powerful acid-producers, suggested the use of bacillus bulgaricus which had been isolated from milk in 1905 by Massol and Cohendy. It was found to actively produce lactic acid in milk and was completely lacking in pathogenicity. In this form and in broth culture he and his successors used, and have continued to use to the present time, the bacillus bulgaricus to excellent therapeutic advantage.

Kendall, in 1910, presented the first American paper on the relationship of the lactobacillus acidophilus and kindred bacteria. In spite of this and many subsequent papers, there is still some confusion in the minds of physicians as to the differences between the lactobacillus acidophilus and lactobacillus bulgaricus. It is a proven fact, however, that the appearance of the growing colonies differ characteristically, and it is also fact that implantation in the intestinal tract can be obtained by feeding lactobacillus acidophilus, whereas it cannot in feeding lactobacillus bulgaricus.

In order to obtain a high degree of implantation with the lactobacillus acidophilus it is necessary to feed the culture in large amount, which is best done by the use of milk culture with or without addition to the diet of lactose or dextrose or by feeding a super-concentrate of the organism. Of course, it is understood that implantation cannot be secured except by feeding viable organisms. When one realizes that more than one-third of the dried fecal content of the bowel from an adult is due entirely to bacterial growth, it can be readily understood that many toxic products which develop as a result of such bacterial growth may be responsible for discomfort in an individual. The predominant organism is the colon bacillus, and it represents approximately 95 per cent of the accumulated growth. The fact that the lactobacillus acidophilus is present in adults in very small numbers, is well proven by the fact that they

*Read before the Roanoke Academy of Medicine, December 2, 1940.

readily appear in considerable concentration when lactose or dextrose is fed in liberal amounts.

My interest was aroused in regard to acidophilus feeding after hearing a paper on the transformation of the intestinal flora by Dr. C. C. Bass, of Tulane University, in 1922. He stated that, after feeding acidophilus milk with or without the addition of lactose, the acidophilus bacillus will multiply to the extent that in many instances no other type of organism can be found in the examined stools. My first acidophilus culture was obtained from Dr. Bass in 1922, this being his strain I. F. 15, corresponding to the strain R. J. of L. F. Rettger, from whom he had originally obtained it. Instructions given by him as to the continuation of the stock culture were carried out, and his instructions for the preparation of the acidophilus milk for feeding were also carried out for a considerable time. At a later time, I secured a commercial broth culture which was used as a stock for making the milk culture by the patient in his own home. Proper temperature for incubation was obtained by the use of thermos bottles. While this type of acidophilus milk served me well in many cases, it was far from being satisfactory or dependable.

It came to my attention about two years ago that the Council of Pharmacy and Chemistry of the American Medical Association had defined a suitable acidophilus milk as one containing one million living acidophilus bacilli per cc. at the time of consumption. This seemed to me to be a very low content to provide a quick transformation of the intestinal flora without consuming an excessive amount of the milk. I then decided to see if a satisfactory acidophilus milk could be developed in Roanoke under laboratory control by one of the operating dairies; so I approached Mr. W. C. Miller, in charge of the laboratory of the Garst Brothers Dairy, who was most receptive to the idea and has worked faithfully with me in this endeavor. We tried making the milk from commercial acidophilus cultures, most of which proved to be unsatisfactory for our purpose.

More than a year ago Mr. Miller was able to secure a super-concentrate of the bacillus acidophilus in semi-paste form, produced by the Farr Laboratory, at Kalamazoo, Michigan, the use of which had been advocated as an addition to sweet milk to produce a sweet acidophilus milk which would give a concentration of two hundred million living bacilli per cc. of milk. The analysis of the super-concentrate showed one hundred billion bacilli per gram. By the addition of two grams of this product to a quart of sweet milk, a definite acidophilus flavor could be detected, and the milk would contain two hundred million bacilli per cc. of milk, this being twice the minimum suggested strength of the Council of Pharmacy and Chemistry of the American Medical Association.

At my suggestion, Mr. Miller began to experiment with the addition of the super-concentrate in varying amounts to whole milk, followed by incubation at slightly differing temperatures and for varying periods of time. We hoped by this procedure to find a standard formula for producing a high concentration acidophilus milk and yet have a palatably sweet taste. He found that the addition of 4.5 grams of the super-concentrate per quart of whole milk, incubated at one hundred degrees F. for five to six hours, produced a most palatable, thick, and comparatively sweet acidophilus milk, which, according to the analysis made of this product by the Farr Laboratory, has an acidophilus count of eight hundred million to one billion bacilli per cc. This shows an increase of 100 per cent or more in the number of bacilli during this short period of incubation, without undue development of other acid-producing organisms which result from long incubation. This product has been rated by the Farr Laboratory as a very superior acidophilus milk. I am glad to say that this milk is now available to the profession as a distribution product of the Garst Brothers Dairy.

Acidophilus feeding with the aim of transforming the intestinal flora should not be looked upon as a special treatment to the exclusion of other forms of treatment, but rather as an aid; although I can assure you that where putrefactive organisms are to be controlled, in many instances it brings complete relief although no additional treatment is given. Ten to fourteen days are required when one quart of acidophilus milk is taken per day to bring about a 50 per cent to 60 per cent implantation and four to six weeks to effect a 90 per cent implantation. The implantation can be hastened by giving small doses of milk of magnesia daily as a mild laxative, also by adding lactose or dextrose to the diet. Should a continuous implantation be desired, it is necessary to continue the feeding regularly, because, if discontinued, the flora will gradually revert to its former state.

The earlier use of acidophilus feeding was in

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treating constipation and mucous colitis. It has a definite field of usefulness in these conditions. It was also used early to excellent advantage in controlling distention in typhoid fever.

I have found its use to give great relief from the distress of abdominal distention associated with many conditions. In the treatment of toxemic conditions of intestinal origin it has been of great help to me, such as malaise, lassitude, headache, neuroses, and toxemic convulsions. I have seen great relief come from its use in distention associated with infections and debilitated states. The heart is greatly relieved in myocardial decompensation from the pressure of abdominal distention by acidophilus feeding, which is often very spectacular indeed. I am now using the feeding as an aid in combating intestinal toxemia in the treatment of arthritis and am hopeful of benefit in this field. It should be, in my judgment, of advantage in the preparation of a patient for surgery, especially where operative work on the gastro-intestinal tract is to be done; also, it should be of help in reconditioning the intestinal tract following surgery. I have been unable to use acidophilus milk with patients who are allergic to milk. Acidophilus feeding can be given them satisfactorily, however, by using the super-concentrate in salads and other foods which are not served hot. Some physicians have used a 2 per cent fat acidophilus milk in preparing formulas for infant feeding with most excellent results.

Now that we have available in Roanoke a superior quality acidophilus milk, and being convinced of its value in the treatment of many conditions, I urge you to use it where indicated. Your interest in this milk will continue to make this fine product available to the profession and Roanoke.

Medical Arts Building.

ABNORMAL SEXUAL REACTIONS.*

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The general attitude toward the individual showing abnormal sexual reactions has changed very little since the time of Justin whose code decreed death for those accused of witchcraft or homosexuality. The writings of Freud and Adler were accepted in part as an explanation of sex being the basis of certain forms of behavior, yet the form of treatment of overt sex acts remained the same. Penta, the nineteenth century Italian psychiatrist, pointed to "impotence" as the sole cause of sexual perversions and at the present time the tendency is to accept this explanation or to base the cause of such a condition entirely upon the failure of complete biological development in the individual. If such a defect is the only accepted explanation of abnormal sexual reactions that are encountered, it means a reversion to the form of treatment advocated by Justin and the refusal to consider the theories of Freud, Adler and others. The entire subject of sex is still considered in a Puritanical manner by the average layman and it is difficult to bring about an unemotional discussion. In dealing with children we find that considerable progress has been made in correcting sex habits but we always find lurking in the background the same antiquated ideas, that often are deeply instilled into the child by adults in an effort to "produce a cure by fear". Sometimes this method apparently produced a cessation of the abnormal sex habit but only for a brief period and in later years there was a more serious exacerbation.

The treatment of sex disorders in children has helped to disprove the idea that it is always a biological defect because excellent results are obtained and the children find normal sexual outlets.

In this way parents have become educated to understand the role of sex in behavior of the children and also themselves. The sex habits of children are usually much simpler to manage than those of adults because the "drives" are less complicated. The incidence of sexual abnormalities among children is high and yet there is no alarm about this situation because we expect them to pass through a homosexual period about the time of adolescence.

*Read before the Junior Clinical Club, March, 1940, and the Neuropsychiatric Society of Virginia, at Radford, Va., June 19, 1940.

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Frequently, due to external causes, this period is prolonged and attracts the attention of the entire community. Then steps are taken to obtain medical aid in an effort to find the cause. Thus, the condition is managed in a logical manner without undue publicity and threats, with the result that, we hope, further difficulty is avoided.

In dealing with adults the general public and many physicians are not inclined to be logical but seize upon the first suggestion which is usually incarceration in a penal institution. These individuals are dealt with in an impulsive and emotional fashion, the main idea being to remove from the community the offender of morals. This results from the fact that adults frequently assault children and occasionally serious crimes are committed in an effort to obtain sexual gratification but certainly this occurs only in the minority of instances. It is not believed that the "normal" child will become a sex pervert because he was persuaded to participate in such a practice by an older person on several occasions, as the practice soon becomes repugnant and is discarded for more healthy habits. Yet, our object is to save the child from such an experience and help the older person if possible. During the past several months there have appeared in the papers the opinions of many different authorities on this subject advocating some form or other of treatment for individuals whose "sexual drives" were abnormal. The majority recommended placement in a penal institution for several years. As the courts may give a three to five-year sentence, this satisfied the public. Psychiatrists are in accord that this is the worst possible plan and will only return to society an individual more confirmed in perverted sexual practices and who is certain to have difficulty again.

To combat this situation, it is necessary to modify the old theory that all perverted individuals are biologically defective and accept the fact that the condition, in many instances, is psychogenic. This would alter greatly the method of treatment of sexual perverts and return to society many useful people. We want to avoid mistakes made in the past in dealing with sexual matters, as for example, prostitution, in which the attempt to abolish it failed completely. If we are to do constructive work, it is necessary to clarify the present status of adults showing abnormal sexual reactions. Noyes divides these individuals into three groups, as follows, which include only such conditions as homosexuality, sadism, masochism and exhibitionism:

1. Those whose sex differentiation was never biologically completed. This group shows physical defects such as body conformation or hair distribution resembling that of opposite sex and also the failure of differentiation in psychosexual sphere.

2. Sexual perversion due to fixation or to failure of complete psychosexual development. This is caused by an abnormal parent-child tie which prevents normal transfer of interest to opposite sex, so that the personality does not develop beyond the homosexual stage.

3. Sexual perversion which has same origin as a neurosis of the compulsion type and is often related to some sexual experience in early life.

To these three groups may be added a fourth which would include those individuals who have an underlying psychosis as the basis of the sexual perversion and in which the treatment is directed toward the psychosis instead of the perverted sexual tendencies. Paranoia is an example of this group, although the Freudian theory is that homosexuality is the cause of a paranoid psychosis.

The following cases illustrate the above facts and also the methods of treatment which appeared to be most satisfactory:

(1).—J. S. The patient was committed to the State Department of Public Welfare as incorrigible when thirteen years of age, in 1934. His father died when he was four years of age and patient was living with his mother. Mother was a chronic alcoholic and said to have syphilis. Conditions in the home were poor and morals bad. On frequent occasions the patient was dressed as a girl and was picked up by older boys to be subjected to sexual abuse. He would obtain money in this way with which the mother used to buy whiskey. The patient was devoted to his mother and tended to imitate her conduct. He was effeminate, interested in dances and talked about being an actor. He was placed in a good foster home and with adequate psychiatric guidance he developed normal sexual desires. He is now in high school and doing well as he has a good insight into the past conduct. Psychological examination showed the patient to be in the average group intellectually.

(2).—L. H. The patient is a twenty-eight-year-old man who was recently arrested for sexual assault on a young boy and girl. The patient has an

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interesting history. His mother separated from the father when he was five or six years of age because of the father's excessive drinking. He was placed with his maternal grandparents and the mother later went to Pennsylvania to work. During this time the mother supported the patient and he depended upon her for the only security he knew. The father visited him frequently but was always disagreeable and would not help him in any way.

At the age of sixteen the patient was placed in a preparatory school but during the first year he was involved with other boys in cashing a forged check. Of the group involved, the patient was the only one sent to an Industrial School where he remained until twenty-one years of age. Here he states he began homosexual practices. He ran away three times from the school but returned each time at the insistence of his mother who was at that time in training as a nurse in Pennsylvania. After leaving the Industrial School he came to Richmond and after a short time was told to leave town because of his homosexual habits. He worked in New York, later in North Carolina, and returned to Richmond. He did not do well as he changed work frequently due to conflicts with others in the offices in which he worked.

Patient states he was engaged twice to be married; the first time he quarreled with the girl and the second girl was accidently killed. This upset him very much and since this time he has had little interest in other girls. He devoted himself to boys' work whenever possible but had to give it up due to reports from people who knew of his past difficulty. Once the patient attempted to adopt a boy but this failed when the mother found out about his past sexual difficulty. He denied homosexual habits while in New York but stated he does like to be with boys. After his return to Richmond he encountered difficulty by bringing boys to his apartment for sexual practices.

Psychiatric examination showed patient to be alert mentally and friendly. He was mildly grandiose and egotistical. Did not consider the present difficulty serious and believed that he would only be told to leave Richmond again. Even during the time he was waiting for trial he attempted to obtain work in the men's department of a large store and was only concerned about what he considered unfair treatment by a few men in town.

Psychological examination placed him in the superior group intellectually and showed that he was adapted to do artistic work or office work such as accounting.

Physical examination was essentially negative.

The patient was seen by several other psychiatrists and the general opinion was that patient was a sexual pervert and would continue to have further difficulty. The court was inclined to deal with this case severely, that is, sentence him to the penitentiary for a period of from three to five years. After a conference with the Judge it was recommended that patient be sent to the Eastern State Hospital and insulin therapy tried.

Patient remained at the hospital only a short period and no treatment was given due to failure of agreement of opinion concerning his mental status. Finally it was agreed to allow patient to return to New York where he resided for past ten years, provided he did not return to this State again. One year later he married and apparently was doing well. In 1940 he was arrested for stealing some money and was sent to the penitentiary. After a few months in the penitentiary it was realized that he needed hospital care and he was placed in a mental institution.

The indications are that his difficulty may have been avoided if he had remained in the first mental hospital instead of being discharged so quickly.

(3).—J. W. This patient was a white man fifty-eight years of age who was arrested for having sexual relations with a girl eleven years of age. He stated he was drinking at the time and did not realize what he was doing.

The past history is of interest in that patient's wife is said to "run around" much of the time and has little to do with him. His only child, a daughter, was accidently killed five years ago and this produced a marked change in the patient. He was depressed, lonely, and would drink excessively. He attempted suicide while being studied and was treated at the Memorial Hospital. There was no evidence of delusions or hallucinations at this time. He was fearful, apprehensive and tearful most of the time. There was a history of patient being treated for syphilis some years ago but blood Wassermann was negative.

In view of the patient's depressed state and attempt of suicide he was committed to the Eastern State Hospital for further treatment.

(4).—B. K. The patient was a white man thirty-

four years of age who was reared in a good home in Richmond. Father died in 1932, and mother died several months later of grief. This was a great shock to the patient as he had always depended upon the mother and was devoted to her. Patient is married, has nice home, a devoted wife and two children. Only recently has his business been good enough for him to seek a few pleasures. One night he visited a home to give an estimate and when he returned to his car a sixteen-year-old boy asked him for a ride.

They began talking about sexual matters and patient engaged in pederasty. The boy wanted patient to reciprocate but he was disgusted with himself because he had done this and while they were talking the police arrested him.

Psychiatric examination did not reveal any abnormal trends. Patient was tense, mildly depressed and repentant. He could offer no explanation of his conduct and was very much ashamed. His wife could not give any reason for patient's conduct as there had been no sexual conflict.

The only explanation seemed to be possible mother fixation and lack of emotional outlets in the past. The boy was found to have gonorrhea and to be retarded intellectually.

Cooperation of the court was obtained and under psychiatric treatment patient gained an insight into his condition. During past three years he has adjusted well and had no difficulty.

CONCLUSION

The above cases are to illustrate the complicated situations that are encountered in the study of abnormal sexual reactions and that each case requires painstaking analysis. A hasty opinion only tends to cause further difficulty for both the individual and society. An early recognition of the psychic factors producing such behavior and adequate psychiatric treatment are conducive to rehabilitation of the individual in society.

Professional Building.

QUININE AS A PROPHYLACTIC AGAINST INFLUENZA

A Study of 6,500 Quininized and 6,500 Non-Quininized Individuals during the Influenza Epidemic of January, 1941.

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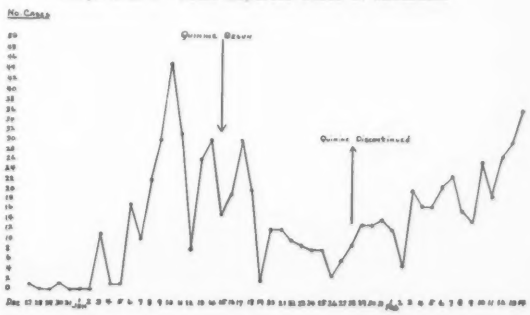
For a good many years writers on the subject have reported the efficacy of various forms of quinine preparations as a prophylactic during epidemics of influenza. Most of the reports dealt with the vasodilatory effect of the drug. Some of these studies have been very good but there was never a large enough series of cases studied together with controls to lend weight to these data.

It has but recently been shown by Showalter[1] that quinine causes a definite leucocyte response. This is exactly what is needed to increase the body defenses during the initial stages of influenza when a leukopenia exists.

At the Radford Ordnance Works, at Pepper, Va., a smokeless powder plant is being constructed by the Mason and Hanger Company for the Hercules Powder Company as part of the National Defense Program. The emergency called for as little lost time from work as possible and when the influenza epidemic started we began to search for some means of prophylaxis aside from the usual health and hygienic measures.

For want of anything better to offer, we decided to issue to 6,500 employees a two weeks' supply of quinine sulphate tablets each 5 grains—14 tablets in a package (one for each day) with instructions that

Graph No. 1.—Total Reported Cases of Influenza.



one tablet be taken each day before going to work. To each of the remaining 6,500 employees 14 tablets of soda bicarbonate each 5 grains were issued with similar instructions.

It will be seen from Graph No. 1 that there was a definite decrease in the total number of cases within 48 hours after quinine was started and that there was a gradual rise in the number of cases when the quinine was discontinued two weeks later.

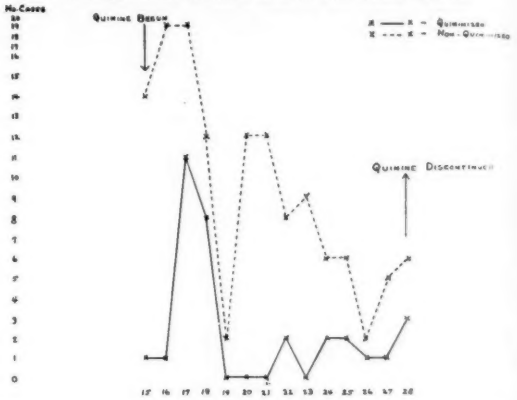
A differential study of the number of cases in the two groups is shown in the table below:

January	Quininized	Non-Quininized
15	1	14
16	1	19
17	11	19
18	8	12
19	0	2
20	0	12
21	0	12
22	2	8
23	0	9
24	2	6
25	2	6
26	1	2
27	1	5
28	3	6
TOTAL	32	132
	19.6%	80.4%

This is illustrated in Graph No. 2.

Summary: (1) A study of 6,500 individuals taking quinine and 6,500 controls not taking quinine during an influenza epidemic was made.

Graph No. 2.—Differential Study of Influenza Cases in Quininized and Non-Quininized Patients Over a Two Weeks' Period.



(2) During the period of quininization the number of cases waned only to rise again when the quinine was discontinued.

(3) A differential study reveals that there was only one-fourth as many cases of influenza in the quininized as compared with the non-quininized group.

NOTE: A study of the value of the newly discovered influenza vaccine is now being undertaken at the Radford Ordnance Works.

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BIRTH INJURIES FROM THE VIEWPOINT OF THE OBSTETRICIAN.*

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It is the general impression that birth injuries have increased in recent years. Conditions prevailing during the past ten years, such as a demand for shorter and painless labor, the abuse of anesthetic and oxytocic drugs, and a distinct increase in the necessity and vogue of resorting to operative methods of delivery give some justification for these impressions. Because of changes in our economic and social environment, the elderly primipara with her labor complications is encountered more frequently today than formerly.

It is difficult from the study of available statistics to determine whether there is an actual increase of birth injuries. The fact that there is a seeming increase can be attributed to more accuracy and care in the filling-out of birth and death certificates and to more accurate diagnosis of the cause of neonatal morbidity and mortality, including careful autopsy study. Statistics compiled by the Children's Bureau of the U. S. Department of Labor show that 52.4 per cent of infant deaths can be attributed to natal and prenatal causes of various kinds, and from 5 to 10

*Read by invitation before the Richmond Pediatric Society, March 21, 1940.

per cent of all deaths in white infants under one year are due to birth injuries. This percentage is on the increase because other causes of infant mortality

TABLE I.—PER CENT OF BIRTHS BY AGE OF MOTHER AND MORTALITY RATE FROM BIRTH INJURIES 1929-1934 (after R. A. Strong)

SECTION	MOTHERS UNDER 25	MOTHERS 25-34	MOTHERS 35-OVER	MORTALITY RATE FROM BIRTH INJURIES
New England	35.8	46.1	18.0	6.5
Middle Atlantic	38.0	46.8	15.2	5.5
East North Central	40.3	44.1	15.6	5.1
West North Central	38.4	44.8	16.8	4.8
South Atlantic	43.6*	41.5*	15.0*	4.2*
East South Central	45.1*	39.8*	15.0*	3.3*
West South Central	46.4*	39.7*	13.9*	3.6*
Rocky Mountain	43.8	41.0	15.2	4.3
Pacific Coast	45.2	44.3	10.4	4.6

*For white population only.

are decreasing. In Table I, which shows the percentages of births by the age of mothers, it is seen that where the mortality from birth injuries is highest, the proportion of births is greater in the older age groups of mothers. Although we have no information regarding the parity of any of the three groups, we may assume that the proportion of primiparae is greatest in the group under 25 years. From this it would appear that age of mothers, rather than parity, is of prime importance as a factor in the prevention of birth injuries.

whether these newer methods are accomplishing this end. A very careful study of the effects of various methods of delivery on fetal and neonatal mortality by H. C. Miller of Yale shows that the lowest mortality occurred in the series delivered by low forceps, and the prognosis is better in low forceps delivery than in spontaneous birth. The highest mortality occurred in the breech extraction and in the version and extraction group. The mortality in the cesarean section group closely approximates that of the mid and high forceps group. Before drawing conclusions, one must take into consideration the probable fetal and maternal complications that led to some of the operative deliveries. Nevertheless, it would appear from Miller's studies that an infant, whether full term or premature, has the best chances for survival when delivered by low forceps.

Obstetrics has participated in the general scientific advances that have been achieved in Medicine and Surgery. Improvements in technique have lessened the danger of various operative procedures and it follows that the indications for operative procedures in the interest of the child and the mother have increased. In the hands of experienced and trained men who fully understand the indications and contra-indications for operative interference and who possess the skill to perform operative maneuvers, the prognosis for the mother and infant is increasingly favorable. The great majority of deliveries, however,

TABLE II.—TOTAL MORTALITY, STILLBIRTH, AND NEONATAL, ACCORDING TO METHOD OF DELIVERY (H. C. Miller)

TYPE OF DELIVERY	TOTAL BIRTH	DEATHS TOTAL	PER CENT	STILLBIRTHS	PER CENT	NEONATAL	PER CENT
Spontaneous	1,844	43	2.3	20	1.0	23	1.2
Low forceps	580	8	1.3	6	1.0	2	0.3
Mid forceps	200	10	5.0	9	4.5	1	0.5
High forceps	19	2	10.5	2	10.5	0	0
Breech extraction	76	14	18.3	10	13.1	4	5.2
Version and extraction	76	25	32.3	18	23.6	7	9.2
Cesarean section	415	25	6.0	7	1.6	18	4.3

The recent trend toward the more frequent employment of operative obstetrical procedures and the widespread employment of analgesic and anesthetic agents is due to: First, an honest effort to alleviate, in so far as possible within the bounds of safety, the suffering incident to labor; Second, to return the mother after the birth of her child to her place in society and in her household in the best possible physical and mental condition; and, Third, a greater emphasis on obtaining a living and healthy infant. Opinion is sharply divided among obstetricians as to

take place in the home or in hospitals where the Obstetrical Service is not rigidly supervised, and the majority of women are attended by physicians who are not primarily interested or specially trained in obstetrics. The use of analgesia and the employment of operative procedures, under such conditions and circumstances, frequently terminates in poor results for both mother and infant. While the attending physician cannot be held responsible for all birth injuries, their frequency and extent are largely influenced by his judgment and skill. The uncoopera-

TABLE III.—PREMATURE INFANT MORTALITY ACCORDING TO METHOD OF DELIVERY
(H. C. Miller)

TYPE OF DELIVERY	LIVE BORN PREMATURE INFANTS	PREMATURE INFANT DEATHS	PER CENT
Spontaneous	119	12	10.0
All forceps	28	1	3.5
Breech Extraction and Version and Extraction	24	3	12.5
Cesarean section	44	12	27.7
Total	215	28	12.8

tive or ignorant woman who fails to give the physician an opportunity to properly study and manage her case until she is well advanced in labor, and apprehensive meddlesome relatives, however well-meaning their intentions, by sometimes driving the physician to pursue a course contrary to his better judgment, must bear some of this responsibility.

Almost every organ or structure of the body can be more or less severely traumatized incident to birth: the eyes and mouth in face presentation; the rectum, testicles, or vagina in breech presentation; the abdominal viscera, chest, spinal column, shoulder girdle, extremities, cranium, and cranial contents in breech delivery; and the cranium, cranial contents, neck, shoulder girdle, and upper extremities in vertex presentation. During abnormal delivery it is often impossible to avoid the use of force, which is dangerous to the integrity of various fetal structures, and this sometimes becomes necessary in order to save life. However, attention to certain details can reduce these dangers to a minimum. In a paper of this scope it is only possible to discuss in a general way the prophylaxis of birth injuries.

General Considerations: Proper prenatal care often enables the physician to evaluate the "obstetric prognosis" in a given case and in many instances to determine before the onset of labor how a given case should be managed. The relationship between size of the fetal head and maternal pelvis can be determined. Position and presentation, as well as unfavorable conditions of the soft parts which may unfavorably affect the course of labor, can be determined in advance. Since fetal morbidity and mortality is considerably greater in breech than in vertex presentation, and since it is difficult to judge cephalopelvic disproportion in breech presentation, an attempt should be made to convert breeches by external version before the onset of labor. This procedure is not without some danger in itself and should never be done under anesthesia.

Recent work in the treatment of hemorrhage and hemorrhagic tendency by administration of Vitamin K or its synthetic substitute deserves our consideration. It is quite possible that in the near future we shall regard the routine administration of this substance during the last few weeks of pregnancy as important prophylaxis against hemorrhage incident to the trauma of labor, and its administration will be as much a matter of routine as is the present administration of calcium.

Analgesia and Amnesia: It is generally conceded that *profoundly deep* amnesia and analgesia induced by morphine, scopolamine, barbiturates, paraldehyde and other agents now in general use have a depressing effect on fetal respiration and circulation and increase the necessity for operative delivery by depressing the normal expulsive efforts of the second stage of labor. Very satisfactory results can be obtained by using moderate doses of these drugs if they are given very early in the first stage of labor, the patient isolated in a darkened room and protected from all unnecessary external stimuli. Moreover, it is our opinion that moderate analgesia and amnesia tend to shorten the first stage of labor. Analgesic drugs should be given early enough in labor so that their effect is beginning to wear off by the time delivery is imminent. These drugs should be used very sparingly, if at all, in premature labor because of their more profound depressing effect on the premature infant.

Conduct of Labor: Either a long hard labor, or a rapid, stormy, precipitate labor may injure the infant. In the presence of very strong uterine contractions, sometimes induced by pituitrin, the fetal head is rammed through a resistant and unyielding cervix and perineum with such haste and force that there is no time for moulding of the head or adjustment of the intracranial circulation between contractions to take place, and tears in the tentorium, rupture of engorged blood vessels, or petechial hemorrhage throughout the brain occur. This is particularly likely to occur in the premature, syphilitic infants or in the presence of a hemorrhagic diathesis. Extremely hard contractions closely following one another without a period of relaxation of the uterus should be controlled by sedation if possible, but deep anesthesia is more often necessary. If the

perineum is resistant a perineotomy should be done as soon as the head reaches the pelvic floor. Unnecessary as it might seem, this is particularly important in the case of small premature infants.

We must differentiate between the effect on the infant of prolonged labor of mild infrequent uterine contractions and prolonged labor of hard frequent contractions. It is only in the latter circumstances that fetal injury may occur. Particularly after the membranes have ruptured intra-uterine pressure is much greater than intravaginal pressure and that part of the head presenting in the birth canal is subjected to tremendous negative pressure. Under these conditions a caput succedaneum develops, which is an engorgement and edema of the soft tissues of the scalp. Schwartz and others have shown that the negative pressure exerts a similar action on the soft tissues on the opposite side of the cranial bones and produces an "internal caput" with edema, engorgement of blood vessels which may rupture, and petechial hemorrhage throughout the brain substance. Particularly in cephalo-pelvic disproportion *excessive* moulding of the skull takes place. Lengthening of one diameter is, in general, compensated by a corresponding shortening of another diameter. It has been shown that the chief function of the falx during birth is the prevention of excessive elongation of the longitudinal and vertical diameters during the required moulding. Dura tears are, therefore, encountered in cases of exaggerated moulding, in contracted pelves, and in instances of rapid delivery.

When signs of fetal distress develop prompt action is necessary. If this distress is of an asphyxial nature due to interference of circulation through the cord or premature separation of the placenta, delivery by the quickest means with due regard for the safety of the mother must be accomplished. It is in complications of this type that the infant is sometimes injured in an effort to save its life. When fetal distress develops as a result of other factors, such as tetanic uterine contractions, or cerebral congestion and edema accompanying impaction of the head with excessive caput and moulding, immediate delivery is contraindicated. The infant is in no condition to stand the extra strain and trauma of an operative delivery through the birth canal. The conditions which brought about the fetal distress must be temporarily relieved by breaking-up the uterine contractions and relieving pressure on the head. When the condition of the fetus has improved, as indicated by improvement in the heart sounds, delivery can be effected with greater safety. We must sometimes anticipate fetal distress before it develops and terminate labor while the infant is still in good condition. The second stage of labor should not be prolonged in the presence of good uterine contractions unless progress is being made. Perineotomy and low forceps delivery will shorten the second stage of labor and in the case of a rigid perineum will sometimes protect the fetal head from several hours of severe pressure.

Influence of Delivery Technique on Birth Injury: Most infants are delivered too rapidly. The necessity for haste once delivery has actually begun has been much over-estimated, and it is probable that more infants are injured as a result of haste and brusque methods than succumb as a result of what appears to be delay in extraction. In forceps operation the probability of injury is in relation to the station of the head in the birth canal. Otherwise, the danger of injury to the head depends largely upon the proper application of the instrument which, in turn, depends upon the accuracy of diagnosis of position. A cephalic application, i.e., with the blades along the transverse diameter of the head, should always be made. When the head is high in the pelvis and is not well flexed, as is usually the case at the inlet, this is frequently impossible. When the head is grasped in its longitudinal diameter with one blade over the face and one over the occiput, not only the soft parts of the face are severely traumatized but the falx and tentorium are put under severe strain and frequently rupture. This application is usually due to a mistaken diagnosis of position. Diagnosis of position is often difficult in the presence of a thick caput or excessive moulding which obscures the suture lines and fontanelles. Palpation of an ear will indicate the direction of the occiput. In posterior position of the occiput accompanied by considerable moulding in which the head has accommodated itself to the shape of the birth canal, rotation to the anterior position subjects the cranial contents to severe strain. Under such conditions the head is best delivered with the occiput posterior.

It is possible to traumatize the brachial nerve roots with the tips of forcep blades that are too long or designed with an exaggerated cephalic curve. When the blades are too short or not applied deeply to the sides of the head and when unavoidable compression takes place, the facial nerve is often injured.

In head presentation difficulty in delivery of the

shoulders occasionally results in injury to the brachial nerve roots, sterno-mastoid muscle, and fracture of the clavicle. This is the result of pulling the head downward with lateral flexion of the neck, with force in order to bring the anterior shoulder under the symphysis. If the air passages be cleared, there is no great need for haste, and pressure on the top of the uterus in the direction of its longitudinal axis will reduce the amount of necessary traction on the head and neck.

The highest percentage of birth injuries occur in breech delivery and extraction following version. Torsion of the body should never be combined with traction. In delivering the shoulders the body should be grasped around the pelvic girdle so as not to injure the abdominal viscera or thorax. Lateral flexion and hyperextension of the spine, particularly the thoracic and cervical portion, in attempts to deliver the shoulders may produce injury to the spinal column and cord. The shoulders are best delivered by Potter's method. The complication of an arm up behind the head in the nuchal position is most likely to occur when the extraction is carried out too rapidly, when the cervix is not completely dilated, and by pressure on the abdomen before the shoulders are delivered. The arm should be freed by pushing the infant's body back up into the birth canal and rotating it from side to side. If this fails, a hand must be introduced into the vagina along side of the head and the arm brought down across the infant's face. In the delivery of the after-coming head, a combination of hyperextension and traction, especially in a lateral direction, carries with it great danger of fracture of a cervical vertebra or injury to the cord. In handling the after-coming head, a modification of the combined Mauriceau-Smellie-Veit method should be tried with caution. Gentle pressure on the head through the abdomen will assist in its engagement and flexion and it should be directed into one of the oblique diameters of the inlet. Care should be used not to injure the mouth, and the finger should be used only to maintain flexion of the head. The tips of the fingers straddling the neck should rest on the clavicles and sternum and should not dig into the supraclavicular fossae where they might injure the brachial nerves. A liberal episiotomy should be done on a rigid perineum. Excessive traction should not be exerted on the neck. The Piper forceps is the safest method by which the head may be delivered as it does away with the possibility of injury to the neck and brachial nerves.

The Immediate Recognition and Treatment of Birth Injuries usually becomes the responsibility of the obstetrician. Often in the first few minutes after birth it is impossible to differentiate between narcosis, asphyxia, shock, and cerebral and spinal injury. A new born infant whose heart rate is persistently slow is almost always suffering from intracranial injury. Gentle handling is of paramount importance. Many infants have been injured by too zealous and rough attempts at resuscitation. The cardinal principles of immediate treatment are: freeing the air passages, keeping the infant dry and warm, and gentle inflation of the lungs with pure oxygen. Stimulants such as coramine, alpha-lobelin, and adrenalin may be given by way of the umbilical vein. After respiration has been instituted, 10 to 20 cc. of maternal blood should be given prophylactically in every instance of hard labor or prematurity. Vitamin K or its synthetic derivative should be given in order to decrease the coagulation and bleeding time by increasing the prothrombin factor in the blood.

SUMMARY AND CONCLUSIONS

It is difficult to prove statistically whether the incidence of birth injury is increasing or decreasing.

Age of the woman has a definite bearing on fetal mortality and birth injury. The incidence of the elderly primipara is on the increase.

There is an increasing demand and use of deep amnesia in the conduct of labor which increases the necessity for artificial termination of labor. These newer methods in the hands of the inexperienced and unqualified give poor results. Low forceps delivery offers the best prognosis for the infant.

Proper prenatal care in its broadest interpretation should decrease the incidence of birth injury by enabling the physician to conduct the labor along a previously conceived course. Prenatal care should lower the incidence of premature birth.

The frequency and extent of birth injury is largely influenced by the judgment and skill of the physician. More emphasis on obstetrics in undergraduate and postgraduate education is desirable. The current postgraduate educational projects of the Medical College of Virginia, University of Virginia, and the Medical Society of Virginia in this State and similar projects in other states should react favorably upon the incidence of birth injuries.

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ORAL PRIMARY FOCI OF INFECTION FROM A DENTAL VIEWPOINT.*

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The starting point for the foci of infection principle in America came about when Sir William Hunter,[1] of England, made the opening convocation address of the Medical College of McGill University in 1910. Following this, Frank Billings,[2] in his Lane Lectures at Stanford Medical School, in 1915, brought out the beginning of its widespread application as a working principle in the practice of medicine and dentistry. He adopted the use of the terms focal infection and focus of infection. One of the original associates of Billings was Dr. Edward C. Rosenow, of the Mayo Clinic. Of him it has been said,[3] "Fortunately the experimental basis for focal infection is most convincing, due to the brilliant work of Rosenow. This work furnished the needed experimental basis for the concept of focal infection, since it demonstrated experimentally a causal relation of foci of infection to systemic lesions and provided an explanation for many clinical observations." Rosenow,[4] in a brief summary of his present ideas, has this to say, "Dental foci of infection, even though symptomless, are common cause of systemic disease beyond a question of a doubt; but the need for further consideration of this important problem is still ahead." In the dental field the discovery and the widespread application of the X-ray was no small factor in the evolution of the focal infection principle.

Dr. G. V. Black, whom we call the father of American Dentistry, made this remark as to what Hunter said in his address at McGill[3]: "He lashed the dental profession unsparingly for allowing chronic abscesses and other forms of chronic suppuration to continue in the mouth. Dr. Hunter called attention to the fact, as it has never been done before, that the foci in the mouth are in the same causal relation to arthritis, nephritis, cholecystitis, endocarditis, etc., as are infected tonsils, or chronic suppurations in any other location. Dr. Hunter was especially severe in his denunciation of the habit of placing plates over infected roots, anchoring bridges to abscessed teeth, or teeth with inflamed or suppurating gums, or placing artificial crown on such roots. Any artificial replacement which promotes uncleanliness came in for condemnation."

He emphasized the importance of the infection caused by staphylococcal and streptococcal organisms, as distinguished from the purely saprophytic infections in which the mouth abounds.

The micro-organisms found associated with oral sepsis are: Streptococcus group predominating, staphylococcus group, pneumococcus group, bacillus pyocyaneus, fusiform bacillus, and Vincent's spirochete.

Infected teeth and pulpless teeth, in addition to micro-organisms, may contain toxic substances which is possible to cause a state of anaphylactic sensitization which may disappear upon the removal of the tooth.

*Read before the monthly meeting of the Roanoke Academy of Medicine, Roanoke, Va., January 6, 1941.

TYPES OF DENTAL INFECTION AND WHERE FOUND

1. *Periapical Infection.* This type of infection is the most virulent because of inclosure within the bone at the apex of a tooth and usually having no drainage (Fig. 1). Chronic periapical abscesses as a rule

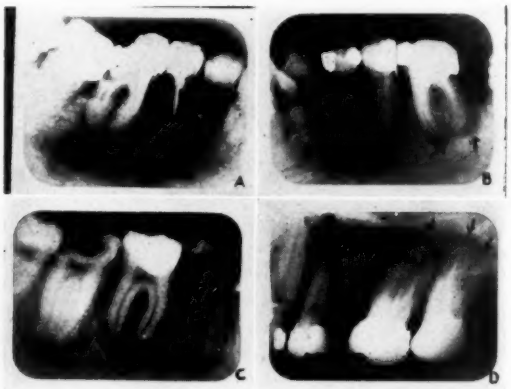

Fig. 1.—Roentgenograms showing chronic periapical infection about pulpless and devitalized teeth.

do not give rise to a single local disagreeable or uncomfortable symptom and easily escape the attention of the patient and dentist. There is usually no pain, soreness, swelling or discomfort, unless the condition becomes acute. It may be the tooth least suspected by the patient and one which has given the least amount of pain. We find patients extremely skeptical regarding the possibility of teeth which have given no discomfort as being sources of infection.

2. *Infection of the Dental Pulp.* A dying pulp or decomposed pulp of a tooth may be a focus of infection without definite periapical symptoms. Periapical areas of osteitis occasionally are found in teeth which may test vital where the infection has been carried from an infected pulp and become localized at the apex.

3. *Periodontal Disease or Pyorrhea.* Pyorrhea pockets or pus pockets along the roots of the teeth (Fig. 2) harbor organisms which pass along the mucous and serous membranes of the alimentary canal, giving rise to secondary foci of infection. There is also a direct invasion of organisms from these pockets by way of the blood and lymph channels. However, most of the exudate passes into the mouth and the virulent effect of the organisms is destroyed by the oral and gastric secretions. However, particular attention should be paid to deep pyorrhea pockets, and those found in between the bifurcations of molar teeth. The deep ones may extend to the apex and cause apical infection and in the bifurcations of molar teeth harbor localized colonies of bacteria and the dissemination of infectious processes.

Fig. 2.—Roentgenograms showing deep pyorrhea pockets along the roots of teeth and between the bifurcations of molar teeth.

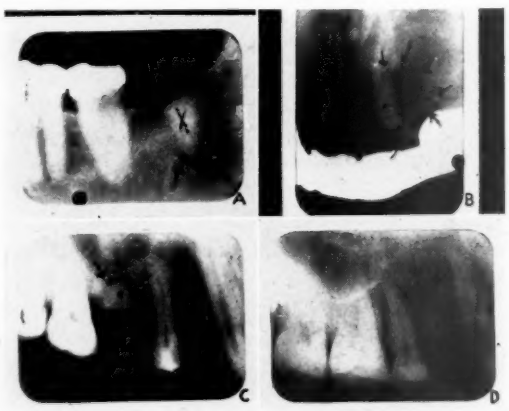

Fig. 3.—Roentgenograms showing residual areas of infection about roots left in after the ordinary method of extraction of teeth.

4. *Residual Infection.* The possibility that edentulous areas (areas where teeth have been previously extracted) and edentulous mouths where patients have been wearing plates for years may be a site of focus of infection have been brought forcefully to our attention (Fig. 3). The fact that patients have had all of their teeth removed and are wearing full upper and lower plates is not evidence that the mouth is free from focal infection.

Dr. Molt,[5] of Chicago, reported a series of 900 areas examined where teeth had been extracted, and 48 per cent showed remaining roots or evidences of residual or retained infection. In the same article, Dr. Molt lists five conditions which may be found in edentulous mouths:

(a) Broken off root fragments.

(b) Impacted or unerupted teeth.

(c) Cysts.

(d) Periaveolar abscesses, remaining *in situ* and discharging through fistulas.

(e) Residual areas of infection remaining unregenerated.

Dr. Boyd S. Gardner,[6] of the Mayo Clinic, reported that, of 10,000 patients examined in one year, 33 per cent have roots left in after the ordinary method of extraction of teeth. About 15 per cent to 19 per cent have impacted or unerupted teeth. About 5 per cent to 10 per cent have residual areas of infection.

It is not uncommon to find patients who thought they had all of their teeth removed, and wearing an upper denture, complain of frequent and severe headaches. Sinus treatment being of no avail, X-ray examination reveals an embedded cuspid or supernumerary teeth, and, upon removal of the teeth, the patient recovers rapidly.

Dr. Cole[7] presented a case in which two upper teeth were removed in an effort to give relief from pain in tic douloureux. This failing, the entire mouth was radiographed and two areas of residual infection were found in the edentulous lower jaw. When these areas were cleaned out, the pain was relieved. Pus taken from one of the areas showed staphylococcus aureus. From the manner of recovery, and since this germ is capable of producing pressure, it was concluded that the presence of this area had caused the tic.

5. Impacted, unerupted or partly erupted teeth are often overlooked as locations of primary foci (Fig. 4).

It is generally conceded that any impacted tooth that has an opening to the surface or has the crown partially exposed can be and usually is a potential area of infection. Lucas,[8] and Wahl[9] claim that impacted or completely imbedded teeth may harbor virulent micro-organisms and be infected. They are of the opinion that after the enamel organ has finished its function and the tooth does not erupt the remnant of the enamel organ or Nasmyth's membrane becomes physiologically and embryologically a functionless tissue and becomes a foreign protein, acts as a chronic irritant to surrounding tissues, and

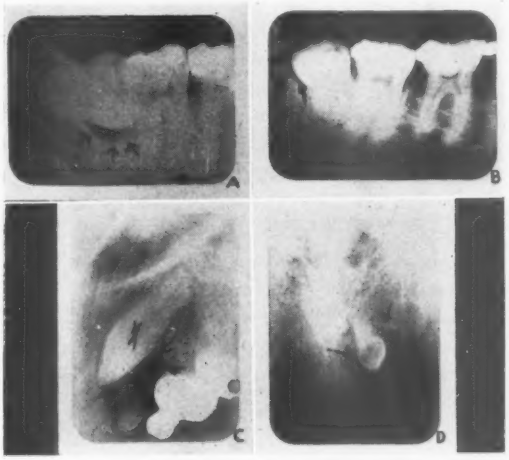

Fig. 4.—Roentgenograms showing infection about the crowns of impacted, unerupted and supernumerary teeth.

produces a localized inflammation. In this area of inflammation and lowered tissue resistances, micro-organisms become localized from the blood stream and, of course, become chronically infected. Therefore, all unerupted, impacted or embedded teeth should be looked upon with suspicion.

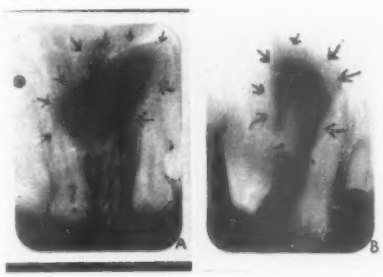

Fig. 5.—Roentgenograms showing infected radicular cysts which developed from pulpless teeth.

6. Very rapidly forming cysts and odontomas are often found about the crowns of impacted or unerupted teeth and apices of pulpless teeth (Fig. 5). These abnormal conditions often become infected.

THE STEPS A DENTIST SHOULD TAKE IN LOOKING FOR FOCI OF INFECTION ABOUT THE TEETH AND JAWS

(1) A thorough dental history.

(2) Exploration for any pockets about the crowns and roots of the teeth.

(3) A vitality test of all the teeth should be made.

(4) A complete X-ray examination should be made of all teeth, including the areas where teeth have been extracted.

The radiographs should be as perfect as can be made and their interpretation should include careful consideration in connection wtih X-ray diagnosis. In my experience with cases referred to me by dentists a large percentage of their dental radiographs show so little of accurate detail as to be of little value when exactness of interpretation is necessary. It is claimed that the dental X-ray machine is one of the most abused apparatuses we have in dentistry. The fact that *some* kind of an image is so easily obtained by merely placing a dental film in the mouth with a tooth between the tube and film without any regard to proper angulation or exposure and development of films for detail bears this out.

The decision as to the teeth which should be extracted, especially in questionable cases, is not easy to make at times. The correct conclusions should be based on the facts disclosed by mouth examination, the relationship of these conditions to the status of the rest of the teeth and the investing tissues, the health of the patient, especially with the advice of the attending physician.

The condition of the patient's health and the physician's advice determine the general program that should be followed, whether a radical or a conservative one. We feel that a conservative program is indicated where the patient is in good health, and is relatively immune to other infections. In cases of the patient suffering from some foci of infection, it should be the rule to eliminate all possible areas of infection about the teeth and jaws, even though this may include the removal of a few divitalized or pulpless teeth which appear to be negative both in X-ray examination and after careful clinical examination. The number of teeth to be removed at one time should be determined by the condition of the teeth and the health of the patient. The program should be ratified by the physician.

CONCLUSION

As to this focus of infection principle, one can only recall the fact that it has survived a quarter of a century of highly active research and clinical trial, and, as a consequence, has received world wide recognition as a valuable clue to the solution of many therapeutic problems of diagnosis and treatment.

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MEDICAL TREATMENT OF NON-TUBERCULOUS INFECTIONS OF THE KIDNEY AND URINARY TRACT.*

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An infection involving the kidney is so intimately associated with the lower urinary tract that it is necessarily included in this paper, though no attempt will be made to discuss the other anatomical divisions separately. This usually falls to the urologist, and, consequently, requires special examinations, such as cystoscopy and pyelography.

*Presented in part before the Mid-Tidewater Medical Society, October 24, 1939, at Miller's Tavern, Va.

There are three types of kidney infection from the pathologist's standpoint, namely, pyelitis, when only the lining of the pelvis is affected; pyelonephritis, when there is associated parenchymal involvement; pyonephrosis, when cavitation has taken place. The first is comparatively rare, for at autopsy there is nearly always concurrent nephritis. Yet as most people with urinary infection recover, one cannot be absolutely certain as to the extent of pathology in the

majority of cases. From the clinical standpoint it makes little difference which is present, as far as medical treatment is concerned, provided there exists adequate drainage.

The route by which infection reaches the kidney has caused much controversy in the past. It is not yet settled, but we have much new information. For many years it was believed that bacteria were brought up from the lower urinary tract *via* the lumen of the ureter directly to the kidney. Lymphatic transmission has also been suggested. There are many arguments against both routes. Certainly it seems difficult to visualize organisms making their way against the current of urine in a narrow tube lined with ciliated epithelium when the additional handicap of gravity has to be overcome. Another popular theory was that organisms could be brought from above, so to speak, by the blood stream to the kidney and thus set up a diffuse infection.[1]

It has been pointed out that two mechanisms might be employed in the majority of cases. Bacteria can travel by the lymphatics surrounding the ureter and thus reach the peri-renal space. From there they would go to the thoracic duct by way of the lumbar lymphatics and eventually reach the blood stream, being finally brought back to the kidney. According to Helmholtz,[2] coccal infection is more apt to be brought to the kidney from the blood, and bacillary by other routes. However, it is his belief, as well as MacCullum's,[3] that kidney involvement occurs chiefly by infection from the bladder by way of the lumen of the ureter. On factors predisposing to kidney infection, all are in accord, namely, stasis, bacteria and lowered resistance.

The route of infection is quite important in treatment if it can be established, as those factors which were instrumental in producing it must be eliminated if one hopes to produce a permanent cure.

The symptoms and signs of urinary infection are too well known to be discussed here. The essential feature of the diagnosis consists in the finding of pus in the urine. Along with this may be numerous complaints, both obscure and otherwise. Fever is perhaps the most common general manifestation, and, unless there is fairly adequate drainage, it is almost invariably present.

The present-day treatment of such infections depends primarily on the bacteriology. One cannot logically use suitable drug therapy otherwise. For this means a catheterized specimen is obtained under as antiseptic conditions as possible (if the patient be a female) and cultured on an Endo plate as well as in brain broth. It is usually quite easy to get the offending organism by such a procedure. One has to look out for the common contaminants, such as diphtheroids, subtilis and staphylococcus, but these can be eliminated by the Endo plate.

Pyogenic organisms can be isolated by transferring a loop of the broth culture to a blood agar plate. These facilities are denied many of us; however, a centrifuge and microscope are within the reach of anyone. A Gram stain of the centrifuged fresh specimen will reveal whether one is dealing with a Gram negative bacillus or a Gram positive coccus. If the former, it is almost certainly a colon bacillus; if the urine is alkaline, it is probably one of the proteus group. The cocci are harder to identify, but, with a little practice, staphylococci and streptococci can usually be distinguished and rarely are other organisms encountered in general practice. The above procedure is simple, quick and is effective in probably 90-95 per cent of instances.

The great majority of urinary infections are produced by the colon bacillus. In most cases, mandelic acid, as either the ammonium, calcium or sodium salt, is given in doses of three grams four times a day. Sometimes it is necessary to augment this with some acid salt, such as ammonium chloride. The pH of the urine is ideally below 5.5 to render it bactericidal. This may be conveniently tested by the nitrazone papers furnished by some manufacturers. The drug should be used for ten days to two weeks, depending on the response. Cultures should be taken every few days and a comparison made as to the number of previous cultures, using the same technique in each instance. In pyuria conditions, after this period of time, it is best to stop the drug and another survey made of the problem. Most clinicians insist on limiting the fluid intake to 1,200 to 1,500 c.c. a day. In very warm weather this should be slightly increased. The complications include gastro-intestinal symptoms, such as nausea, vomiting and hematuria. Both of these clear promptly on withdrawal of the drug. It would be well to mention here that it is important to determine the amount of impairment of renal function before beginning mandelic acid preparations; this is probably only necessary in elderly individuals. The P.S.P. is as reliable as any and has the distinct advantage of simplicity, and can be done in the home or office with equal ease. As with most

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such tests, one technique should be established and followed in all cases. The exact amount should be injected intravenously and specimens taken at the end of fifteen minutes, one-half hour, one hour, and two hours. Normally, each specimen has roughly doubled the concentration of the succeeding one. The total concentration varies from 60-70 per cent.

With the cocci and proteus group, mandelic acid is not usually of much benefit unless the pH of the urine is rendered very low. Streptococcus fecalis, however, responds well. Proteus produces an alkaline urine and it is very hard to get the pH to a satisfactory level.

Sulfanilamide has been very effective with proteus, the hemolytic streptococcus and with the colon bacillus.[5] The dosage employed is similar to that in other conditions. Some physicians prefer beginning with the initial dose of 4 grams (60 grains), then 4 or 5 grams daily for two days, when it may be dropped to 3 or 4 grams or according to the size of the individual, the response to therapy as manifested by cultures and the blood concentration. The same dangers attendant to this drug in other conditions are also present here; the blood has to be carefully watched for hemolytic anemia, agranulocytosis and the urine for red blood cells and albumin. Reports all over the country testify as to its effectiveness. It is convenient and does not have to be continued any longer than two weeks in a great majority of cases.

For the staphylococcus and pneumococcus infections, sulfapyridine has been employed. The dosage is about the same as that for sulfanilamide. The same dangers are also to be watched for, but, in addition, peripheral neuritis may occur and the very grave and distinct possibility of calculi. These are composed of acetyl-sulfapyridine crystals.[6] It has been said that with a pH of 8 or more, this can be largely avoided. If sulfapyridine is used, the urine should be watched very carefully for red blood cells and at the first signs the drug should be discontinued.

Recently, sulfathiazole has been employed for staphylococcus and pneumococcus infections, and it is felt that it is equally as effective as sulfapyridine, slightly less toxic, and less apt to produce calculi. It has also been found to be of considerable value against many other organisms including B. coli. It has been less potent against streptococcus fecalis.[7] In spite of the many encouraging reports, it should be remembered that it has not been used sufficiently long enough to have its dangers well established, and any patient under such administration must be watched with double caution.

There are many antiseptics used in the past, which have been highly regarded but which have been more or less replaced by chemo-therapy. Among these are urotropin, acriflavine and pyridium.[8] It is doubtful just what value these have; each one was ushered in with considerable enthusiasm and each one has declined rapidly in popularity.

The time honored procedure of forcing fluids and changing the reaction of the urine has relieved many people. This is the safest of all and the least likely to cause distress to the patient. Elderly subjects, particularly those who have had pyuria for a long time, seldom get permanent cures from chemo-therapy. The urine rapidly becomes sterile and it almost invariably shows pus shortly after the drug is discontinued. Explanation of this on specific pathological data is unsatisfactory, but it is obvious that if the same factors responsible for the production of an infection are still present, a recurrence is to be expected. Such individuals consistently show pus and bacteria but get along fairly well until some other illness supervenes, or until the resistance apparently becomes lowered, and then develop symptoms, often from pyelitis. Here active treatment is required. This is one of the commonest problems confronting the internist or general man. Who has not had a paralytic, a patient with a fractured hip, or a chronic respiratory infection go through such a cycle? Usually they are old and have associated cardio-vascular disease in addition. It is felt that large amounts of fluids and alkaline or acid salts, as indicated, is the best approach to this type of case.

To briefly summarize the above, it may be stated that there are several possible choices of treatment available in nearly every case. Careful deliberation is necessary before a decision is made, but such time is well spent and will be rewarded with optimum results. Each patient presents an individual problem and it is to be so handled. Occasionally a mixed infection is present; sometimes the offending organism is resistant to the drug usually most effective. When this occurs, it is wise to search for calculi or other obstructive agents before instituting further therapy.

There are general measures in treating urinary infection which are important regardless of the drug used. These include bed rest, with enough elevation to facilitate adequate drainage, and the usual sedatives or analgesics to provide relief from pain and

restlessness. It is not always necessary to limit fluids, but, when using the sulfanilamide group or mandelic acid it is best not to go higher than the minimum amount the patient can take without becoming really uncomfortable. Sponge baths are excellent when the temperature is high, and bed clothes should not be allowed to remain damp.

When the acute symptoms have subsided and the infection is apparently under control, it is well to establish, when possible, the inciting factor. In the male particularly, there is apt to be an obstruction somewhere in the lower urinary tract. It is unusual to see a healthy person suddenly develop an acute urinary infection otherwise. Careful search usually reveals stone, stricture or enlarged prostate. Such study may require a urologist. However, most people feel that cystoscopic examination should not be done during an acute process unless there is definite indication; although a safe and easy procedure in competent hands, it is possible to add trauma to infection, and actually do harm. The intravenous pyelogram is becoming more and more popular and, when there is no serious diminution of kidney function, often yields all the information required.

In the past it has perhaps been the custom to regard urinary infection too lightly. It is certainly true that very few patients die from acute pyelitis, cystitis, etc., but the after-effects may be serious. Recent work has shown the relationship of hypertension to kidney disease. It has been estimated that 15-20 per cent of cases of "essential" hypertension are associated with kidney infection[9]; of these, pyelonephritis ranks highest. It would seem that early eradication of all urinary infections, particularly in young persons, might reduce this group to a minimum.

SUMMARY AND CONCLUSIONS

1. From the medical standpoint, the diagnosis of urinary tract infection is made by the finding of pus in the urine.

2. Knowledge of the bacteriology is the essential guide to therapy. Gram stain of the sediment is a simple and usually adequate method for determining this.

3. Urinary infections are seldom fatal, but, because of possible serious after-effects, should be stringently treated early. Elderly patients are best handled conservatively.

4. Any case which does not yield to treatment in a satisfactory period of time should be investigated by a competent urologist.

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Professional Building.

ACUTE HEMOLYTIC ANEMIA AND RENAL INSUFFICIENCY OF SULFANILAMIDE AND SULFAPYRIDINE THERAPY.

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Following the report by Harvey and Janeway,[1] in 1937, of two cases of acute hemolytic anemia complicating sulfanilamide administration, there have been many additional studies. The most comprehensive of these is that of Wood,[2] published in 1938.

This report is concerned with eight patients in whom acute hemolytic anemia developed during sulfanilamide administration, and one in which the same developed during sulfapyridine therapy. Two of the nine patients developed renal insufficiency with nitrogen retention: a complication which adds to the

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complexity of the syndrome following severe blood hemolysis.

CASE REPORTS

Case 1. O. H., a colored male, aged fourteen, was admitted to the hospital on June 20, 1938, with a history of pain and swelling of the right knee of eleven days' duration. Temperature was 103 degrees Fahrenheit. The diagnosis of acute gonococcic arthritis was made. Sulfanilamide therapy was begun with an initial dose of 40 grs., and continued with 20 gr. four times daily. On July 2, after receiving 680 gr., the patient developed the phenomena of severe acute anemia. Examination of the blood showed a reduction of the hemoglobin from the admission level of 78 per cent to 18 per cent, and the red blood cells from 3,220,000 to 1,060,000. There was a rise of the leukocytes from 12,700 to 33,500. The patient recovered promptly following the withdrawal of sulfanilamide, two transfusions, and intravenous saline.

Case 2. J. B., a colored male, aged eight, was admitted to the hospital on June 18, 1939, in an almost moribund state. The history was that he had had a slight sore throat from which streptococci had been cultured. He was given sulfanilamide by his physician three days before admission; the exact dosage was not known, but it was not large. On admission the patient was almost completely comatose, air hunger was a prominent symptom, and the mucous membranes were very pallid. Temperature was 101.4; pulse 126; respiration 32. The remaining physical examination was negative except for a faint precordial systolic murmur. The hemoglobin was 19 per cent; red blood cells 900,000; white blood cells 64,200 with 76 per cent neutrophiles. Non-protein nitrogen was 48 and the icteric index 14. He was treated with blood transfusions and fluids, but died within twenty-eight hours after admission. Permission for an autopsy could not be obtained.

Case 3. C. B., a colored male, aged twenty-one, was admitted to the hospital with a history of having developed anemia four days after sulfanilamide therapy had been used by a private physician as treatment for acute rheumatic fever. His first symptoms were weakness and dizziness. On examination, he was found to be acutely ill, air hunger was a prominent symptom, and the mucous membranes were pallid; urinalysis was entirely negative; acid in reaction. The hemoglobin was 35 per cent; red blood cells 1,500,000; white blood cells 37,500 with 88 per cent polymorphonuclear neutrophiles. He was treated with fluids, blood transfusions, and sodium bicarbonate by mouth in order to secure and maintain an alkaline reaction of the urine at the kidney level.

Laboratory data:

Admission	Hbg.	R. B. C.	N. P. N. (mgm.%)
6-18-39	35%	1,500,000	
6-19-39			126
6-21-39	36%		
6-22-39	46%	2,250,000	
6-26-39			80
7- 6-39	60%	3,460,000	37

His recovery was prompt and complete.

Case 4. E. B., a colored male, aged fifteen, was admitted to the hospital on August 16, 1939. One week before admission he was given sulfanilamide by a private physician as treatment for sore throat. He received 80 gr. for two days, and 40 gr. for two more days. On the fourth day he developed nausea and vomiting, and one day later passed bloody urine. On examination the patient appeared acutely ill; the mucous membranes were pallid, and the sclerae were slightly jaundiced. Urinalysis showed albumen and casts, but no red blood cells were found. The white blood count was 24,450 with 71 per cent neutrophiles. The icteric index was 19. The remaining laboratory data is as follows:

Admission	Hbg.	R. B. C.	N. P. N.
8-16-39	22%	1,220,000	
8-17-39	34%		137
8-19-39	40%	2,100,000	
8-21-39			167
8-24-39	44%		194
8-26-39	52%		140
8-29-39	48%		81
9- 1-39	48%		57
9- 5-39	50%		39

The patient made an uneventful recovery.

Case 5. A colored female, aged twelve, was admitted to the hospital on March 26, 1940. Four days before admission she was treated with sulfanilamide for a sore throat, receiving 15 grains four times a day. Nausea and vomiting began almost immediately and dizziness was severe in twenty-four hours. On admission the examination showed a weak, lethargic colored female; the mucous membranes were pallid, and a systolic murmur was heard over the entire precordium. Hemoglobin was 40 per cent; red blood cells 1,820,000; white blood cells 16,050 with 82

per cent neutrophiles. The patient was given multiple transfusions and intravenous glucose and saline.

She made an uneventful recovery.

Case 6. A colored female, aged seven, was admitted to the hospital on April 7, 1940, in a critical condition with lobar pneumonia in the right base. Hemoglobin was 50 per cent; red blood cells 2,800,000; white blood cells 18,500 with 88 per cent neutrophiles. She was given sulfapyridine, gr. 30 on admission, and gr. 15 every six hours. In four days she was irrational; temperature, which had fallen to normal, was 101°; hemoglobin had fallen from 50 per cent to 15 per cent; red blood cells from 2,800,000 to 91,000; and white blood cells had risen from 18,500 to 84,000. Urinalysis showed bloody urine, most of which was hemoglobin. Icteric index was 50, and non-protein nitrogen 62 mgm. per cent. The patient was given blood transfusions and fluids, with return of the non-protein nitrogen to normal.

Recovery was complete.

Case 7. C. J., a colored male, aged fourteen. This patient was admitted to the hospital June 3, 1940, in a critically ill condition. His history was of malaise, headache, and fever of several days' duration, beginning April 29, 1940. At this time he was given sulfanilamide, 10 grains a day for four to five days; patient apparently recovered. But his symptoms returned in two weeks, and he was again given sulfanilamide 30 grains a day for four days. The hemoglobin was checked by his physician, the readings being 60 per cent on May 28, 1940, 50 per cent on May 29, 1940 and 40 per cent on May 30, 1940. The patient was admitted to the hospital on June 3, 1940; he was acutely ill. Temperature was 105 degrees Fahrenheit, pulse 126, respiration 32. Mucous membranes were pallid. Sclerae were slightly icteric. Examination of the head, neck, lungs, and heart showed no abnormalities. The spleen was barely palpable. There was no blood in the feces. Urine was dark, acid in reaction, sp. fir. 1.014*, albumen 1 +; sediment showed many granular casts and a few W.B.C. Hemoglobin was 20 per cent; R.B.C. 1,070,000; W.B.C. 14,100; with 76 per cent polymorphonuclear neutrophiles and 24 per cent lymphocytes. The blood sugar was 124 mgm. per cent, N.P.N. 78 mgm. per cent with creatinine 2.4 mgm. per cent.

Patient's blood culture was positive for the E. Typhosus on May 29, 1940, and his agglutinations were positive with the "O" antigen in dilutions of 1-200 on May 29, 1940, 1-400 on June 3, 1940 and 1-640 later.

Patient was treated with fluids, blood transfusions, and soda bicarbonate by mouth.

His subsequent laboratory data was:

Admission	Hbg.	R. B. C.	W. B. C.	N. P. N.
6/ 3/40	20%	1,070,000	14,100	78 mgm.%
6/ 4/40				56 mgm.%
6/ 5/40	35%		10,100	
6/ 8/40	45%	2,260,000	3,850	
6/10/40				29 mgm.%
6/12/40	55%	2,530,000	3,100	

Patient's temperature dropped to 99°-100° and he appeared to be convalescing well when temperature began to climb to 103°-105° on June 20, 1940. On June 23, 1940, patient had a severe hemorrhage from the bowel with bloody and tarry stools and resultant shock. Hemoglobin was 35 per cent. He was treated for this and transfused several times with no further bleeding. Further recovery was uneventful.

Case 8. M. B., a colored female, aged nineteen. This patient was admitted to the Genito-Urinary Service of this hospital on June 26, 1940 complaining of abdominal pain, nausea, and vomiting. She was quite toxic and it was not possible to elicit a good history from her. For three weeks before admission, she had suffered with lower abdominal pain. Three days before admission (June 23, 1940) she developed chills, fever, nausea, and vomiting and bilateral costo-vertebral angle pain. Examination showed a toxic, acutely ill, colored female. T.-P.-R. was 120 degrees (Fahrenheit)-90-20. Blood pressure 120/80. Examination of the head, neck, lungs, and heart showed no abnormalities. Examination of the abdomen revealed tenderness in both lower quadrants and in both costo-vertebral angles. These findings suggested pyelitis. Catheterized urine showed a 1 + albumin and 25 to 30 white blood cells to each high power field. Blood count was hemoglobin 90 per cent; R.B.C. 4,600,000; W.B.C. 11,000 with 87 per cent polymorphonuclear neutrophiles.

Patient's temperature remained elevated, 104° to 106°. She was given sulfanilamide from June 26, 1940 to June 30, 1940, dosage being gr. 15 three times a day. Blood culture taken on June 28, 1940 was found to be positive for E. Typhosus, stool culture positive on July 1, 1940. Sulfanilamide was discontinued on June 30, 1940, but hemoglobin fell to 35 per cent on July 2, 1940 and W.B.C. to 3,500. Patient was given intravenous saline and blood trans-

fusions, but failed to rally and died on July 3, 1940.

Case 9. V. S., a colored female, aged nineteen, was admitted to the medical service on September 29, 1940 with the history of sore throat, malaise, and headache of one day's duration. Examination was negative except for a well developed and nourished colored female, with enlarged inflamed tonsils with patches of exudate over each. T.-P.-R. was 103°-126-30. Urine was acid in reaction, with a trace of albumin, and 4-6 W.B.C./H.P.F. Blood examination showed hemoglobin of 80 per cent; R.B.C. 4,430,000; W.B.C. 10,900 with 79 per cent polymorphonuclear leukocytes. Sulfanilamide therapy was begun, 30 grains as an initial dose and 15 grains every four hours. This was continued for four days, at which time the mucous membranes were quite pallid, hemoglobin had fallen from 80 per cent to 48 per cent, and the W.B.C. had risen from 10,900 to 22,000. N.P.N. was 43 mgm. per cent and icteric index 19 units. Sulfanilamide was discontinued at once, fluids were forced by mouth, alkalies were given by mouth in the form of soda bicarbonate, and a blood transfusion was administered. Recovery was prompt.

DISCUSSION

In Wood's[2] report, he analyzes twenty-one cases of acute anemia developing in a series of 522 cases treated with sulfanilamide. He considered the development of the anemia to be an individual peculiarity of the patient and not due to an over-dosage of the drug. In his patients, nausea and dizziness developed twelve to twenty-four hours before the onset of the anemia; and the initial drop in hemoglobin occurred twenty-four to seventy-two hours after the beginning of sulfanilamide administration. The maximum anemia occurred usually on the fifth day, but occasionally as early as the third or as late as the seventh day. Elevation of temperature usually occurred with the hemolytic crisis.

All of Wood's[2] cases recovered, but there have been two deaths reported with anemia following sulfanilamide administration and one with anemia following sulfapyridine administration. The first was by H. Wood,[3] and the second by Koletsky.[4] In neither of these patients was nitrogen retention reported. The case, however, of Ravid and Chesner,[5] in whom the anemia followed sulfapyridine administration, showed a definite nitrogen retention (non-protein nitrogen as high as 258 mgm. per cent).

It is well known that nitrogen retention may complicate hemorrhagic malaria with hemoglobinuria. Toone[6] is reporting such a patient with the non-protein nitrogen of 220 mgm. per cent. A similar case has been reported by Wakeman *et al.* The writer studied a paretic patient on malarial therapy who developed renal insufficiency, with a non-protein nitrogen of 115, who promptly recovered following quinine therapy.

The pathological reports of the cases of H. Wood[3] and Koletsky[4] showed evidence of acute anemia of the organs, hyperplasia of the bone marrow, and "kidney changes which resembled those of blackwater fever". In these kidneys there was described tubular degeneration with casts in the tubules, hemoglobin casts. Throughout the interstitial tissue there was edema and leukocytic infiltration. In the case of Ravid and Chesner,[5] there was tubular degeneration, and in many tubules the lumina were plugged or distended with free and intracellular golden-yellow and brownish pigment in the form of casts.

These kidneys resemble, to a varying degree, the kidneys of patients who die with blood transfusion reactions (in whom clinically there is hemoglobinuria, jaundice, oliguria, and nitrogen retention), and the kidneys of animals in which blood transfusion reactions have been produced experimentally. Microscopically such kidneys show tubular degeneration, deposition of brownish material (acid hematin) in the tubular lumen with plugging of the lumina of many tubules, and edema and leukocytic infiltration of the interstitial tissue. It is most likely that the nitrogen retention which occurs in some cases of acute hemolytic anemia following sulfanilamide and sulfapyridine administration is due to similar renal changes.

Baker and Dodds[8] showed experimentally that transfusion reactions would produce no oliguria or nitrogen retention and no microscopic changes in rabbits provided the animals' urine was alkaline before the transfusion reaction was produced. They also found that, if the urine of the rabbits was acid before the transfusion reaction occurred, there would be (clinically) oliguria, nitrogen retention and death in uremia, and the kidneys would show the nephropathy mentioned above. This work has been confirmed by DeGowin *et al*[9] on dogs.

Because of the reports of Baker and Dodds[8] and DeGowin *et al*,[9] and because of similarity of the kid-

ney lesions of patients with acute hemolytic anemia and patients with blood transfusion reactions, we administer alkalies to these patients to change the reaction of the urine to an alkaline one and to maintain this alkalinity.

SUMMARY

1. Eight cases of acute hemolytic anemia occurring during sulfanilamide administration are reported: six recovered and two died.

2. One case of acute hemolytic anemia occurring during sulfapyridine administration is reported: this patient recovered.

3. In the first eight cases (those treated with sulfanilamide), two developed quite marked nitrogen retention, as shown by elevated non-protein nitrogen values, but neither was clinically uremic. One developed moderate nitrogen retention; he also was not uremic.

4. It is believed that the kidney changes described, in other reports, of tubular degeneration, deposition of acid hematin casts in the tubules, with blockage and dilatation of some of the tubules, and interstitial edema and leukocytic infiltration are similar to the kidneys of patients with blackwater fever, and patients and animals with blood transfusion reactions.

5. Because of the work of Baker and Dodds,[8] and of DeGowin *et al*,[9] which showed that kidney changes with resulting hemoglobinuria and nitrogen retention following blood transfusions in animals occurred if the urine was acid before the transfusion reaction occurred, but did not occur if the urine was alkaline; and because of the similarity of kidney lesions of patients with acute hemolytic anemia from sulfanilamide or sulfapyridine and patients with blood transfusion reactions, it is recommended that alkalinization with sodium bicarbonate, to the point of maintaining an alkaline reaction to the urine, be used on all patients with acute hemolytic anemia.

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913 Allied Arts Building.

PLATYSPONDYLY.

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Platyspondyly is a term first used by Putti,[1] and derived from the Greek, meaning wide (platy) and vertebra (spondylos). This was mentioned by Nau[2] who described it as a widened bilobar vertebra. This condition is caused by failure or delay of fusion in the membranous stage of the embryological development. In this stage, the layer of mesoderm on each side of the median line, after the appearance of the medullary canal and the notochord, divides into the mesoblastic somites. These sclerotomes divide into two parts at the inter-segmental fissure, which process is the neo-segmentation of Van Ebner.[3] The cranial half of one sclerotome joins with the caudal half of the other to form the primitive vertebrae. There is a perichordal septum dividing each vertebral anlage into two halves, and these halves fuse later to form the vertebrae. Failure or delay of this fusion causes hemi-vertebrae or platyspondyly.

Putti[4] found this condition present in the fourth and fifth lumbar vertebrae, and in each of his cases there was also a spina bifida present. He considered the widening of the vertebrae to be due to the lack of union of the neural arches. Lance[5] considered this anomaly to be a failure of fusion in the membranous stage. While spina bifida may occur in any stage, platyspondyly only occurs in the membranous stage. Lance describes three types, one which usually occurs in the fourth or fifth lumbar, as the cases of Putti.

The second type is a widened vertebral body placed in two cuneiform segments with the apex central and the bases lateral. This may be associated with spina bifida which is a failure of fusion of the posterior

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arches or somatochisis which is a failure of fusion of the body. This is most frequent in the dorsal or servico-dorsal areas. In type three, the superior and inferior surfaces are concave in the center, while the inter-vertebral disks are convex and higher than normal.

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Correspondence

Dr. Stewart R. Roberts.

TO THE EDITOR:

Dr. Stewart R. Roberts died in his home in Atlanta at 5:40 on Monday evening, April 14. I went through to Atlanta on Tuesday night and attended his funeral on Wednesday afternoon. His body was taken to Oxford, Georgia, thirty or forty miles from Atlanta, and encrypted there in the family plot. Emory College was established at Oxford and it was there even when Dr. Roberts got his academic degree and until it was transferred to Atlanta and transformed by the generosity of the Candlers and of others into Emory University. Stewart Roberts had the Chair of Clinical Medicine in the School of Medicine of Emory University. Although he kept up with the progress in medicine and made use of all the scientific skill within his reach in his medical ministrations, he never forgot that a man is a spirit and his method of practice embraced all the arts of the old-time family doctor. When he sent a patient to me, he always revealed as much knowledge of his patient's immaterial structure as of the patient's physical mechanism and he tied his patients to him. Many of them leaned upon him and I suppose that he became a victim, perhaps, of their leanings. He had a rather robust frame and he should not have passed away at the early age of sixty-two, but his heart had been doing its work more and more poorly for three or four years and the condition of his heart finally became such that it had to have rest.

Wednesday was a lovely day in Atlanta, a little too warm but beautifully clear and the dogwoods were in full bloom, and so was the wistaria, and so were many other flowers. I suppose I had not been in Atlanta at dogwood time. The city must feature that tree. At any rate, there are thousands and thousands of dogwoods in Atlanta.

I had never before seen anywhere so many and such lovely cut flowers as were in the Glenn Memorial Methodist Church at Emory University, in which the brief service was held. Someone remarked that Stewart, if he were conscious, approved it all and enjoyed it all. His secretary told me that, in spite of tightly swollen lower extremities and in spite of lips that were generally blue, and in spite of frequent shortness of breath and of a good deal of pain within his chest, he was busy with patients in his office only four or five days before his death. I had a sweet little note from him on the Friday before his death on Monday. I regarded it as a farewell message and I think he so intended it.

You will recall that he made the first address before our Section on the History of Medicine*. I think that statement is true. I believe that I was the first Chairman of the Section. When I asked Stewart Roberts if he would talk to us he replied promptly that he would gladly do it if we would allow him to talk in his own way about the prison maintained by the Confederate Government at Andersonville down below Atlanta. He had spent, I happen to know, a great deal of time for a good many years and probably no little money in collecting data about that horrible old place. I thought he did a brave thing well in presenting the history of the old prison to us so graphically and so frankly. His secretary told me that not so long ago he shook up some of the folks in Atlanta by a thesis on General William Tecumseh Sherman. Stewart told me when I was in his home with him in Atlanta three or four years ago, in the beginning of his sickness and while he was being kept in bed, that General Sherman was simply a highly efficient modern soldier and that he was going to present him as such if he lived long enough.

J. K. HALL.

*Of the Richmond Academy of Medicine.

Mental Hygiene Activities

There has been a real impetus in mental hygiene activities in Virginia during the last months which cannot but be gratifying to those who are concerned with problems of mental health. In April, at the State Conference of Social Work, the Virginia Society for Mental Hygiene and the Medical Society of Virginia jointly sponsored a program of three meetings. Two of the sections were concerned with a discussion of problems of adolescence in relation to the national emergency and the part community facilities play in meeting the needs of young people. Adolescence has been the subject under consideration of the Mental Hygiene Society for the year, and this was tied in with the theme of the conference as a whole which emphasized community action and home defense. Participating in these two meetings were Dr. James Williams, psychiatrist for the State Department of Public Welfare; Dr. James M. Hinton, department of psychology at Washington and Lee University; Mrs. Margery C. Wyatt, psychiatric social worker, State Department of Public Welfare; Mr. Roy L. McLaughlin, president of the National Association of Training Schools; and Dr. George H. Preston, Commissioner of Mental Hygiene, Maryland. The third session concerned itself with the problem of the national venereal disease control and its relation to national defense. On this program were Mildred Hearsey, United States Children's Bureau; Dr. E. M. Holmes, Jr., Virginia State Department of Health; and Dr. N. B. Hon, U. S. Public Health Service. The meetings were well attended and the discussions were lively and full of content. Through them social workers, psychiatrists and medical men were brought together for consideration of their common problems which should mean much toward the spread and understanding of mental hygiene.

Another important mental hygiene activity was the meeting sponsored by the society at the annual meeting of the American Psychiatric Association. This meeting was addressed by Dr. Abraham Myerson and Dr. L. G. Rountree, chief medical officers of the Selective Service System. It drew a large crowd, both of visiting psychiatrists and interested lay people. The National Psychiatric meeting was also of very real importance in interesting the people of Virginia in problems of mental hygiene. Many lay people attended and the excellent newspaper accounts of papers given at the meetings reached many more.

The Virginia Society has been active in several Virginia communities by conducting programs. A successful meeting in Danville in May was followed by an institute in Norfolk, which had as its subject Mental Hygiene and the Emergency. We feel that Dr. Wilson, the president of the society, is to be congratulated on his excellent planning of this fine series of meetings which should make a real contribution to intelligent understanding of problems of mental health throughout the state.

MARGERY COLLIER WYATT.

Public Health Statistics

I. C. RIGGIN, M.D.,
State Health Commissioner of Virginia.

The report of the Bureau of Communicable Diseases of the State Department of Health for April, 1941, compared with the same month in 1940 and for the period of January through April, 1941, compared with the same period in 1940 follows:

	Apr. 1941	Apr. 1940	Jan.-Apr. 1941	Jan.-Apr. 1940
Typhoid and Paratyphoid Fever	9	9	42	39
Diarrhea and Dysentery	87	89	227	289
Measles	9,259	499	23,238	1,166
Scarlet Fever	141	192	734	753
Diphtheria	28	47	151	234
Poliomyelitis	3	1	10	6
Meningitis	21	4	45	24
Undulant Fever	0	0	3	4
Rocky Mountain Spotted Fever	3	0	4	3
Tularaemia	0	0	15	24

TYPHOID CARRIER CONTROL

The State Department of Health, through its Bureau of Communicable Diseases, is revising and intensifying its program of supervision of carriers of typhoid fever organisms. In areas served by full-time local health departments the control of typhoid carriers will continue to be under the direction of the local health officer. In areas without health service supervision and follow-up visits will be under the direction of the central office staff.

The importance of this activity has long been recognized and has been a part of the Department's program for several years. The need for more intensive control has been indicated as a result of the many military and industrial defense activities.

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Military and Naval Section

The following have been added to the list of

Examining Physicians on Local Boards

Dr. Mallory S. Andrews, Norfolk.
Dr. L. H. Apperson, Richmond.
Dr. H. C. Ballou, Richmond.
Dr. C. G. Bennett, Bishop.
Dr. S. O. Bennett, Norfolk.
Dr. M. H. Bland, Norfolk.
Dr. J. H. Blackwell, Jr., Richmond.
Dr. W. M. Bowman, Petersburg.
Dr. Sheldon D. Carey, Floyd.
Dr. W. H. Copley, Richmond.
Dr. W. H. Craig, Richmond.
Dr. Martin D. Delaney, Alexandria.
Dr. W. W. Dunn, Richmond.
Dr. J. Roland Ellison, Suffolk.
Dr. E. E. Epperson, Meadowview.
Dr. M. S. Foster, Bridgewater.
Dr. Samuel H. Garst, Staunton.
Dr. J. M. Green, Ferrum.
Dr. R. L. Hillman, Emory.
Dr. Wm. M. Hoffler, Suffolk.
Dr. W. C. Jackson, Amonate.
Dr. Bernard Jones, Culpeper.
Dr. R. D. Jones, Jr., Norfolk.
Dr. Southgate Leigh, Jr., Norfolk.
Dr. Gershon J. Levin, Norfolk.
Dr. V. L. Litsinger, Farnham.
Dr. William Lueders, Jr., Staunton.
Dr. C. F. Manges, Blacksburg.
Dr. J. M. Mason (Col.), South Boston.
Dr. E. H. Marstellar, Manassas.
Dr. E. L. McGill, Petersburg.
Dr. William Meyer, Herndon.
Dr. Ernest B. Miller, Elkton.
Dr. J. M. Newman (Col.), Richmond.
Dr. B. L. Parrish, Norfolk.
Dr. Marshall J. Payne, Staunton.
Dr. G. L. A. Pogue (Col.), Bedford.
Dr. Robert S. Preston, Richmond.
Dr. W. S. Quaintance, Slate Mills.
Dr. M. G. Rock, Bristol.
Dr. W. E. Roye, Fincastle.
Dr. H. L. Segar, Warsaw.
Dr. E. N. Shockley, Bassetts.
Dr. E. C. Shull, Herndon.
Dr. Robert J. Styers, Amelia.
Dr. G. G. Tanner, Grottoes.
Dr. M. H. Todd, Norfolk.
Dr. W. H. Turner, Jr., Round Hill.
Dr. E. S. Waring, Fairfax.
Dr. Charles Watson, Broadway.
Dr. Reid White, Jr., Lexington.
Dr. J. E. Womack, Staunton.
Dr. W. W. Wilkinson, LaCrosse.

Supplemental List of Medical Advisory Board Members

Dr. Charles V. Amole, Alexandria.
Dr. Manfred Call, 3rd, Richmond.
Dr. N. M. Canter, Harrisonburg.
Dr. Carson L. Fifer, Alexandria.
Dr. Herbert C. Jones, Petersburg.
Dr. W. R. Warriner, Crewe.
Dr. J. L. Hamner, Mannboro.

Medical Reserve Officers

In addition to those previously listed in this JOURNAL, the following doctors have been ordered to extended active duty with the regular army by the commanding general of the Third Corps Area:

Major Percy G. Hamlin, Williamsburg—Hoff General Hospital, Santa Barbara, Calif., as chief of section of Neuro-Psychiatry.
Capt. Samuel M. Bloom, Clifton Forge—Chief, E. E. N. and T. Service, Station Hospital, Camp Lee.
Capt. Fielding Jason Crigler, Charlottesville—Fort Belvoir.
Capt. Carl William LaFratta, Richmond—Fort Belvoir.
Capt. Walter Albert Porter, Hillsville—Fort Belvoir.
Capt. Guy C. Richardson—Cantonment Hospital, Fort McClellan, Ala.
Lt. Marion Fisher Jarrett, Farnham—Fort Eustis.
Lt. Vincent E. Lascara, Norfolk—Camp Shelby, Miss.
Lt. Joseph Liebman, Norton—Camp Lee.
Lt. Sam Silver, Waynesboro—Fort Belvoir.
Lt. William Parker Terry, Charlotte C. H.—Fort Belvoir.
Lt. James Volpe, Jr., St. Charles—Fort George G. Meade, Md.

Naval Medical Reserve Officers

Lt. Comdr. Charles A. Young, Roanoke—Naval Hospital, Portsmouth.
Lt. (jg) J. Edward Amiss, New Market—Naval Hospital, Portsmouth.
Lt. (jg) Horace Leonard Jones, Jr., Richmond.
Lt. (jg) Joseph P. Pollard, Alexandria.

Capt. Grant R. Elliott of Orange, formerly stationed at Camp Blanding, Fla., has been transferred to Savannah Air Base, Savannah, Ga.

Lt. M. Cohen, class of '31, Medical College of Virginia, is stationed at Camp Wolters, Texas, where he is attached to the X-Ray Department.

Lt. Otto S. Steinreich, class of '38, Medical College of Virginia, is at Station Hospital, Fort Bragg, N. C.

Miscellaneous

Interesting Rates.

The following letter has come into our hands. It occurred to us it may prove interesting to our readers:

BRINKLEY HOSPITAL, Inc.
Del Rio, Texas

April, 1941.

DO YOU WANT TO SAVE $50.00?

Dear Friend:

The enclosed coupon, if presented at the office of the BRINKLEY HOSPITAL, INC., Del Rio, Texas, on or before midnight May 31, 1941, will entitle you to $50.00 credit on any operation or treatment as described below:

PROSTATE TREATMENT

A. Examination, Operation and one week in hospital ----------$360.00

B. Examination, Operation, specified amount of medical treatment and one week in hospital ----------$460.00

C. Surgical Technique, Medical Treatment, (one week's Sex Hormone Treatment for prostatism only, when indicated by examination), one week in hospital and the Guarantee of Service Plan. (In addition to your $50.00 coupon, we will allow you the equivalent of your round-trip railroad fare on this treatment only ----------$750.00

For the treatment of VARICOSE VEINS
only ----------$150.00 to $175.00
Examination, board and room not included.

For the treatment of PILES
only ----------$250.00 to $350.00
Examination, board and room not included.

For the treatment of RUPTURE or HERNIA
only ----------$250.00 to $350.00
Examination, board and room not included.

Our thorough examination ----------$50.00
(The $50.00 coupon is not allowed on the examination fee.)

Many of you have written us indicating that you would like to come to BRINKLEY HOSPITAL, INC., for treatment but have been postponing it because of cold weather or not being able to make financial arrangements. Now May is the ideal month to make this trip and we feel this special offer of $50.00 credit will place the price of medical or surgical treatment within the reach of most everyone.

We cannot guarantee this offer to be in effect after midnight May 31, 1941, unless authorized by a special meeting of the Board of Directors, and inasmuch as we feel sure many will want to take advantage of this exceptional offer, we suggest that you write or wire us at once, so that we may make a reservation for you.

Sincerely yours,
BRINKLEY HOSPITAL, INC.

JHD:CH

P. S.—Upon arriving in Del Rio, go directly to BRINKLEY HOSPITAL, INC., on the mezzanine floor of the Roswell Hotel.

COUPON

Bring this coupon with you any day on or before midnight May 31, 1941, and if you stay and have an operation or stay and have a treatment you will be given credit for $50.00. This $50.00 credit will be allowed on the operation or treatment of prostate gland enlargement or infection, the treatment of ruptures, piles, varicose veins, leg ulcers, fissures, fistulae, ulcers of the stomach.

The only place this $50.00 credit is not allowed is on the examination fee.

BRINKLEY HOSPITAL, INC.
Del Rio, Texas.
NON-NEGOTIABLE

Woman's Auxiliary to the Medical Society of Virginia

President—MRS. GRIFFIN W. HOLLAND, Eastville.
President-Elect—MRS. E. LATANE FLANAGAN, Richmond.
Recording Secretary—MRS. HAROLD W. POTTER, Hilton Village.
Corresponding Secretary—MRS. J. WALKER JACKSON, Machipongo.
Parliamentarian—MRS. JAMES B. STONE, Richmond.
Treasurer—MRS. REUBEN F. SIMMS, Richmond.
Chairman, Press and Publicity—MRS. HENRY M. SNEAD, Petersburg.

Norfolk Auxiliary

The Woman's Auxiliary to the Norfolk County Medical Society held its regular meeting on May 2nd at the home of the President, Mrs. A. G. Horton. The treasurer reported seventy-four paid-up members. Mrs. T. Elmore Jones read a paper on the life of Jane Todd Crawford and it was decided to send ten cents per capita to the Jane Todd Crawford Memorial Fund.

The following officers were elected for the coming

year: President, Mrs. Walter P. Adams; president-elect, Mrs. W. E. Butler; vice-presidents, Mrs. W. Tilden Smith, Mrs. J. R. St. George, and Mrs. S. Byron Pope, Jr.; secretary, Mrs. R. M. Reynolds; assistant secretary, Mrs. B. L. Parrish; corresponding secretary, Mrs. R. Bryan Grinnan, Jr.; assistant corresponding secretary, Mrs. Brock D. Jones, Jr.; treasurer, Mrs. James W. Anderson; assistant treasurer, Mrs. W. R. Tyson; parliamentarian, Mrs. C. C. Smith; and historian, Mrs. Starke A. Sutton.

Mrs. Herbert Rogers, state chairman, and Mrs. Millard B. Savage, local chairman for the state meeting to be held at Virginia Beach in October, made several announcements concerning this meeting. Plans are being made for a fine convention and for making it enjoyable, interesting, and profitable.

After the meeting, Mrs. Horton entertained delightfully at a tea for the members and guests.

RUTH WILSON,
Publicity Chairman.

Book Announcements

Books received for review are promptly acknowledged in this column. In most cases, reviews will be published shortly after the acknowledgment of receipt. However, we assume no obligation in return for the courtesy of those sending us the same.

Edith Cavell. By HELEN JUDSON. New York. The Macmillan Company. 1941. Octavo of xvii-288 pages. Cloth. Price $2.50.

Essentials of Gynecology. By LEO BRADY, M.D., F.A.C.S., Assistant Professor of Gynecology University of Maryland; Associate in Gynecology, Johns Hopkins University; etc. And ETHNA LOUISE KURTZ, R. N., Supervisor, Gynecological Operating Room, Johns Hopkins Hospital, 1935-1940. The Macmillan Company. New York. 1941. Octavo of ix-257 pages. Illustrated. Cloth. Price $2.75.

Essentials of Dermatology. By NORMAN TOBIAS, M.D., Senior Instructor in Dermatology, St Louis University; Assistant Dermatologist, Firmin Desloge and St. Mary's Hospitals; etc. Philadelphia. J. B. Lippincott Company. 1941. xii-497 pages. Illustrated. Cloth. Price $4.75.

The Story of Clinical Pulmonary Tuberculosis. By LAWRASON BROWN, M.D., Late Director of Trudeau Sanatorium; Lecturer in Trudeau School of Tuberculosis; etc. Baltimore. The Williams and Wilkins Company. 1941. Octavo of ix-411 pages. Cloth. Price $2.75.

Proctology for the General Practitioner. By FREDERICK C. SMITH, M.D., M.Sc.(Med.), F.A.P.S., Formerly Associate in Proctology, Graduate School of Medicine, University of Pennsylvania; Editor, the Weekly Roster and Medical Digest, Philadelphia County Medical Society; Editor, The Medical World; etc. Second Revised Edition. Philadelphia. F. A. Davis Company. 1941. Octavo of xxx-466 pages. Cloth. Price $4.50.

New Books.

The following are recent acquisitions to the Library of the Medical College of Virginia and are available to our readers, the only cost being return postage:

Adriani, J.—The pharmacology of anesthetic drugs.
Bailey, H.—Surgery of modern warfare.
Bell, E. T.—A textbook of pathology. 3rd edition.
Biological Symposia, volume 3.
Blumer, G.—The Therapeutics of Internal Diseases, volume 3.
Estabrook, G. H.—Man—the mechanical misfit.
Fletcher & Raven—War wounds and injuries.
Gaddum, J. H.—Pharmacology.
Galdston, I.—Progress in medicine.
Gordon-Taylor, G.—The abdominal injuries of warfare.
Greenhill, J. P.—Obstetrics in general practice.
Hartwig, J. G.—How authors write.
Hume, E. H.—The Chinese way in medicine.
James & Fickling—Injuries of the jaws and face, with special reference to war casualties.
Krogman, W. M.—A bibliography of human morphology, 1914-1939.
Krusen, F. H.—Physical medicine.
Lewis, T.—The soldier's heart and the effort syndrome.
Northfield, D. W. C. *et als*—Special surgery in wartime.
Ogilvie, W. H.—War primer on wound infection: its causes, prevention and treatment.
Perla & Marmorston—Natural resistance and clinical medicine.
Robson, J. M.—Recent advances in sex and reproductive physiology.
Sherrington, C. S.—Man on his nature.
Sigerist, H. E.—Medicine and human welfare.
Silverman, M.—Magic in a bottle.
Waterman, J. M.—With sword and lancet.

First Aid in Emergencies. By ELDRIDGE L. ELIASON, A.B., M.D., Sc.D., F.A.C.S., Professor of Surgery, University of Pennsylvania, School of Medicine and Graduate School of Medicine; Surgeon, University of Pennsylvania, Presbyterian and Philadelphia General Hospitals. Tenth Edition Completely Revised and Reset. Philadelphia. J. B. Lippincott Company. 1941. 12mo of xii-260 pages. With 126 Illustrations. Cloth. Price $1.75.

This is not a book for the average first aider in that it puts such dangerous drugs as opium, car-

bolic acid, and bichloride of mercury and such equipment as hemostats, sutures, needles, hypodermics, etc., into the hands of the layman. For anyone in charge of a group twenty-four hours or more from further medical aid who has been instructed by an expert in the use and dangers of the recommended procedures, the book goes into detail for treatment far beyond the field of the person who has a physician within a few hours' call.

The format of the book makes for quick and easy reference. The symptoms are listed clearly and in good detail for differentiation of treatment. The order of approach to subjects is excellent. The chapter on poisons, especially the lists and illustrations of plants containing natural poisons, could be studied with profit by many doctors called on to treat children who chew leaves. Poor proofreading has left several instances where figures referred to have no relation to the subject under discussion. The author might have simplified his book for the average layman by mentioning fewer antiseptics and drugs. But then the book is not written as a reference for the average layman but as a text for a student who will have from thirty to fifty hours' instruction and "Laboratory work" and who has some physiological background and still more judgment.

M. K. CARY.

Physical Medicine. The Employment of Physical Agents for Diagnosis and Therapy. By FRANK H. KRUSEN, M.D., F.A.C.P., Associate Professor of Physical Medicine, the Mayo Foundation, University of Minnesota; Head of the Section on Physical Therapy, the Mayo Clinic; Member of the Council on Physical Therapy of the American Medical Association; Past President of the American Congress of Physical Therapy; Past President of the Academy of Physical Medicine. W. B. Saunders Company. Philadelphia. 1941. Octavo of 846 pages, with 351 illustrations. Cloth. Price $10.00.

Dr. Krusen has done a superb piece of work in placing in one readable volume most of the important features of Physical Therapy as it should be practiced today. The organization of the material, combined with an exhaustive index, makes reference to any desired subject rapid. Conflicting points of view are presented but the author wisely states what seems to him to be the most reasonable view, thus leaving the reader in no doubt as to the author's opinion.

The general practitioner will find this to be the "answer to his prayer" for a good book on Physical Therapy; in it he will find many practical points which will assist him in the proper use of Physical Medicine. The internist, surgeon, orthopedist, and physical therapist also will find this to be a most valuable aid in their work. The medical student will find that this book provides the much desired orientation in this field which forms the bridge between medical science and physical science.

Comprehensive bibliographies following each chapter add immeasurably to the value of this book. It is in truth a small reference library of Physical Medicine. For anyone interested in Physical Therapy or any phase of this field, this book is recommended.

BEN L. BOYNTON.

Synopsis of Materia Medica, Toxicology, and Pharmacology. For Students and Practitioners of Medicine. By FORREST RAMON DAVISON, B.A., M.Sc., Ph.D., M.B., Assistant Professor of Pharmacology in the School of Medicine, University of Arkansas, Little Rock. St. Louis. The C. V. Mosby Company. 1940. 633 pages with 45 illustrations, including 4 in color. Cloth. Price, $5.00.

This new book on pharmacology is intended to be a brief discussion concerning those drugs essential for the student of medicine and the practicing physician. While there are errors which are inherent in the preparation of any manuscript, all in all the book is very well written and in keeping with modern pharmacological thought. In this day, when there is such a great need for physicians to become more familiar with pharmacologic principles, a suitable modern text dealing with pharmacology should be available to every practitioner. Not as brief as its name might indicate, the book covers more or less the same material and to the same extent as is the case with such standard books as Sollmann, Cushny, Bastedo, and McGuigan. If the physician has not access to a copy of one of the last mentioned texts, he will find this present publication generally equally satisfactory.

H. B. HAAG, M.D.

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VIRGINIA MEDICAL MONTHLY

Official Publication of the Medical Society of Virginia

(Founded by Landon B. Edwards, M. D., April, 1874)

WYNDHAM B. BLANTON, M. D.
Editor

AGNES V. EDWARDS
Business Manager

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All correspondence regarding editorial matter, original articles, and policy should be directed to the Editor. Questions relating to subscription rates, advertising, etc., should be addressed to the Business Manager, 1200 East Clay Street, Richmond, Virginia. The MONTHLY is not responsible for the opinions and statements of its contributors. All advertisements are accepted subject to the approval of the Council on Pharmacy and Chemistry of the American Medical Association. Annual Subscription, $2.00. Single Copies, 25c.

VOL. 68. JUNE, 1941. No. 6

Editorial

Diet and National Defense.

Russell M. Wilder, at the recent meeting of the American College of Physicians in Boston, presented an interesting national nutritional program. Commenting upon the deficiencies in the American diet and the remarkably effective results in Germany of a nationally controlled diet, he brought out the well-known facts that our people eat too little meat, drink too little milk and consume too much sugar. His program in summary was to supply all of the essential components of the Vitamin B complex in flour by fortifying it with thiamin chloride, riboflavin, nicotinic acid and iron, and to supply sufficient Vitamin A and D to the consumer, whatever his economic level, by fortifying the processed fats, such as oleomargarin and the lards, with the addition of Vitamins A and D. He would recognize that the too great sugar consumption would continue but he would require the makers of sugar to incorporate in it dried milk powder which would add both protein and calcium to the diet without greatly disturbing the taste or appearance of the sugar. If citrus fruits and iodized salt were added a national diet would be attained which would guarantee maximum efficiency in a population which he believed might soon be called upon to fight for its life.

Panel Discussions.

Medical societies and those in charge of programs for their meetings are constantly in search of new and better ways of bringing the progress of medicine to the attention of their members. The reading and discussion of papers seem to have become standardized. Innovations took first the form of symposia, then of round table discussions, lately of panel discussions.

The Medical Society of Virginia will try for the first time at its Virginia Beach meeting the panel discussion in place of the round table discussion. Three physicians will take part in each panel, one acting as leader, the other two as his assistants. The leader will read questions which have been sent to him by members of the society prior to the meeting and will call upon his assistants to discuss them. Sometimes he will discuss them himself. If a question is controversial, one assistant may take one point of view, the other, another, and the leader may side with either or against both. When written questions are exhausted, questions from the floor will be in order. Panel discussions have the advantage of cutting short extraneous talking and of offering more than one expert. On the whole, a panel discussion should give a rapidly moving and constructive type of conference.

The N. P. C.

The National Physicians' Committee for the Extension of Medical Service is a voluntary, non-political and non-profit making organization dedicated to the task of making more widespread the distribution of the most effective methods and equipment in medicine and surgery, and of familiarizing the public with the values, methods and achievements of American medicine.

In a recent publication it calls attention to the verdict handed the A. M. A. by a Federal jury in Washington, D. C., a verdict which said, in effect, that "organized medicine had entered into a conspiracy—a criminal conspiracy—but that there were no conspirators"; that "A crime had been committed —but that there were no criminals"; that "Trade had been unlawfully restrained—but that none were responsible for the restraint."

The N. P. C. summarized the issues involved in this Federal Court action as follows: "(a) The exclusive right of physicians to 'practice medicine.' Presumably, a layman or a lay organization should have the legal right to provide medical service. (b) The right of physicians to control or influence the qualifications of physicians on hospital staffs or the qualifications of physicians to be granted courtesy privileges in hospitals. (c) The right of physicians to control or importantly influence conditions in hospitals under which intern training is provided. (d) The right of physicians to determine educational and ethical standards that shall qualify individuals for the rendering of medical service."

The N. P. C. maintains that these are basic rights, essential to the safeguarding of the public and that since they have been questioned every physician must aid in the required solution, which in its opinion has two parts: "First, American Medicine must be given authority from the court of final jurisdiction, for a code of conduct. This authorization must define the extent and the nature of such controls.

"The next step in the process of securing this authorization is a new trial of the A. M. A. suit in the Federal District Court, or an appeal to the Appellate Court and finally an appeal, if necessary, to the Supreme Court of the United States.

"This is the responsibility of the A. M. A. Already, the necessary steps have been taken. Regardless of time, energy, or expense involved, there will be no retreat or compromise until all of the issues have been settled by the authority with final jurisdiction.

"Second, The public must be made aware of its vital interest in this all-important issue."

The N. P. C. maintains that if the American public really realized how serious was the threat to traditional medicine as they have known and profited by it in this country they would turn thumbs down on a movement that is designed to completely alter its whole structure. The committee is doing all within its power to bring to public attention the true facts of what American medicine has stood out for in its diligent search for a method of better serving the indigent and lower income groups and in extending to all persons a more effective health service.

The committee points out that Labor, by acting collectively in its own interest exacts enormous annual contributions from its membership to establish defense funds that have made it invulnerable not only to public opinion but to legal restraint. Medicine needs to learn some of these lessons of collective action, but it proposes to avoid the compulsion exercised by the unions on its members.

Sulfanilylguanidine and Sulfadiazine.

With fascinating fecundity the sulfonamids continue to produce offspring of increasing bacteriostatic and bacteriocidal power. In the treatment of the bacillary infections of the intestinal tract, sulfanilylguanidine gives great promise. There are reports that it is being used by the British in Egypt with notable success. It is a readily soluble, rapidly excreted sulfonamid of low absorptive qualities in the intestinal tract where acetylation does not occur. Its theoretical possibilities were first investigated by Marshall and reported in the Bulletin of the Johns Hopkins Hospital (September, 1940).

Another most interesting derivative is sulfadiazine which is being evaluated clinically at the present time, especially in the treatment of pneumonia. It is apparently a useful, safe and simple drug of low toxicity, and great penetrability, with the ability of reaching high concentrations in the blood and tissues without injurious effects. It has been employed chiefly in pneumococcus infections where it has been found to be as effective as sulfapyridine without showing any of sulfapyridine's untoward effects.

At the recent meeting of the American College of Physicians in Boston, Bullowa, Finland and Blake

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endorsed it unanimously as probably the best of all the drugs so far developed for the treatment of pneumonia. Finland treated 178 run-of-the-mine cases of pneumonia in the Boston City Hospital with a mortality of 10.7 per cent. Bullowa stated that in patients under fifty years of age his mortality was only 3 per cent. It was agreed that with the new type of chemotherapy practically every one under forty years of age who is treated early enough and in proper dosage gets well. An initial dose of 4 grams should be given, to be followed by 1 gram every four hours until recovery. Sulfadiazine also gives promise of being an effective chemotherapeutic agent in staphylococcal and streptococcal infections.

Department of Clinical and Medical Education of the Medical Society of Virginia

Summer Short Course.

The second summer short course in Recent Advances in Medicine will be held at the University of Virginia Hospital the week of June 16 to 21. A list of eighty proposed topics was recently mailed to Virginia doctors with the request that they indicate those they would like to have discussed. Enrollment will be limited to fifty doctors this year. Instructors will be drawn from the entire staff of the Department of Medicine. The sessions will be devoted to four lectures each morning followed by clinics, ward rounds, and demonstrations in the afternoons. Evenings will be devoted to conferences, moving pictures and a banquet. Registration should be completed before June 10 through Dr. Staige Blackford, Chairman of the Committee on Postgraduate Clinics, Box 1174, Charlottesville, Virginia.

Local Courses.

A postgraduate course in Medicine and Surgery was held in Hampton and Newport News during March and April. This course was given at the request of the Elizabeth City County Medical Society. The full program was as follows:

ARTHRITIS—Dr. Oscar Swineford, University of Virginia.
CARDIAC IRREGULARITIES—Dr. J. Edwin Wood, University of Virginia.
SURGICAL ASPECTS OF SCIATICA—Dr. J. M. Meredith, University of Virginia.
THE ANEMIAS—Dr. Powell Williams, Medical College of Virginia.
CANCER OF THE CERVIX—Dr. William Henry Parker, University of Virginia.
SIMPLIFIED TREATMENT OF CERTAIN FRACTURES—Dr. Robert V. Funsten, University of Virginia.

The doctors attending one or more of the six meetings were as follows:

Dr. E. L. Alexander, Newport News.
Dr. O. T. Amory, Newport News.
Dr. Burl Bassette, Hampton.
Dr. M. B. Beecroft, Newport News.
Dr. C. D. Bradley, Kecoughtan.
Dr. Harvey G. Bland, Newport News.
Dr. A. A. Creecy, Newport News.
Dr. R. A. Davis, Newport News.
Dr. R. H. Edwards, Newport News.
Dr. J. B. Homan, Langley Field.
Dr. W. H. Howard, Hampton.
Dr. H. D. Howe, Hampton.
Dr. W. S. Hunt, Fort Monroe.
Dr. E. S. Jones, Hampton.
Dr. F. A. Kearney, Hampton.
Dr. Benedict Kudish, Fort Monroe.
Dr. R. A. B. Lloyd, Phoebus.
Dr. I. B. McEachin, Newport News.
Dr. J. L. Mann, Hampton.
Dr. J. E. Marable, Newport News.
Dr. E. B. Mewborne, Newport News.
Dr. R. B. Newman, Hampton.
Dr. Paul J. Parker, Hampton.
Dr. R. T. Pierce, Newport News.
Dr. W. J. Pijanowsky, Newport News.
Dr. J. W. Sayre, Newport News.
Dr. A. T. Scott.
Dr. G. B. D. Stephens, Newport News.
Dr. N. L. Smallens, Langley Field.
Dr. Willard P. Smith, Hampton.
Dr. G. C. Tyler, Newport News.
Dr. O. W. Ward, Phoebus.
Dr. R. H. Wright, Phoebus.
Dr. Seymour Zaller, Kecoughtan.

The Loudoun County Medical Society also is conducting a postgraduate course during the month of May. The following is the program for this course of meetings which are being held in the Loudoun County Hospital at Leesburg on Thursday evenings:

INFANT FEEDING—Dr. Jay M. Arena, Duke University.
TOXEMIAS OF PREGNANCY—Dr. Tiffany Williams, University of Virginia.
OFFICE PRACTICE OF GYNECOLOGY—Dr. R. A. Ross, Duke University.
NEWER PHASES OF PNEUMONIA TREATMENT—Dr. H. B. Mulholland, University of Virginia.
MANAGEMENT OF HEAD INJURIES—Dr. John M. Meredith, University of Virginia.
HYPERTENSION IN YOUNG ADULTS—Dr. Harry Walker, Medical College of Virginia.

Spring Clinics.

UNIVERSITY OF VIRGINIA

The twenty-seventh Postgraduate Clinic of the University of Virginia Department of Medicine was held at Charlottesville on Friday, April 11. Members of the staff presented a *Symposium on Therapy*.

Doctors attending the Clinic were as follows:

Dr. L. H. Apperson, Richmond.
Dr. Howard Armstrong, Harrisonburg.
Dr. H. L. Baptist, Ivy.
Dr. C. D. Bennett, Chatham.
Dr. C. L. Booker, Lottsburg.
Dr. R. E. Booker, Lottsburg.
Dr. L. M. Braswell, Lynchburg.
Dr. Alfred Burger, University of Virginia.
Dr. O. K. Burnette, Culpeper.
Dr. A. C. Byers, Harrisonburg.
Dr. H. G. Byrd, Louisa.
Dr. F. L. Byers, Harrisonburg.
Dr. G. C. Campbell, Staunton.
Dr. F. T. Cassiday, Fredericksburg.
Dr. H. T. Chelf, Culpeper.
Dr. Homer E. Clarke, Massie's Mill.
Dr. Elizabeth Cole, Norfolk.
Dr. John E. Cole, Fredericksburg.
Dr. J. C. Coulter, Charlottesville.
Dr. H. S. Daniel, Louisa.
Dr. C. O. Dearmont, White Post.
Dr. J. W. Devine, Jr., Lynchburg.
Dr. S. F. Driver, Troutville.
Dr. T. S. Englar, Charlottesville.
Dr. E. F. Flora, Roanoke.
Dr. J. E. Gardner, Roanoke.
Dr. M. T. Garrett, Waynesboro.
Dr. C. F. K. Gaylord, Staunton.
Dr. D. M. Gibbs, Front Royal.
Dr. J. T. Gill, Richmond.
Dr. M. M. Gordon, Martinsville.
Dr. R. S. Griffith, Waynesboro.
Dr. E. A. Harper, Lynchburg.
Dr. W. F. Hartman, Swoope.
Dr. M. B. Hiden, Leesburg.
Dr. R. B. Hightower, Washington, D. C.
Dr. H. G. Hudnall, Covington.
Dr. H. B. Hutt, Alexandria.
Dr. C. H. Iden, Berryville.
Dr. R. Walter Johnson, Lynchburg.
Dr. Thomas E. Jones, Charlottesville.
Dr. H. W. Judd, Mineral.
Dr. J. Paul Kent, Altavista.
Dr. J. P. King, Radford.
Dr. W. A. Kyger, Free Union.
Dr. L. Long, Jr., Charlottesville.
Dr. Anita Lotti, Charlottesville.
Dr. Florence Mahoney, Staunton.
Dr. G. R. Minor, Charlottesville.
Dr. Carleton Moorman, Altavista.
Dr. E. B. Morgan, Fincastle.
Dr. J. O. Mundy, Charlottesville.
Dr. J. A. Murphy, Washington, D. C.
Dr. Dan O. Nichols, Charlottesville.
Dr. Wm. J. Olds, Front Royal.
Dr. W. H. Paine, Charlottesville.
Dr. Marshall J. Payne, Staunton.
Dr. C. G. Pearson, Charlottesville.
Dr. B. F. Randolph, Arrington.
Dr. A. C. Ray, Ashland.
Dr. B. A. Rice, Forest.
Dr. J. H. Roberts, Roanoke.
Dr. A. F. Robertson, Staunton.
Dr. E. B. Robertson, Danville.
Dr. W. H. Saunders, Roanoke.
Dr. Ernest Scott, Lynchburg.
Dr. O. N. Shelton, Orange.
Dr. E. W. Stratton, Charlottesville.
Dr. J. L. Stringfellow, Culpeper.
Dr. G. V. Thompson, Chatham.
Dr. J. A. M. Thompson, Charlottesville.
Dr. W. M. Tunstall, Covington.
Dr. W. H. Turner, Round Hill.
Dr. M. H. Urner, Charlottesville.
Dr. C. M. Vaughan, Harrisonburg.
Dr. C. J. Waller, Staunton.
Dr. W. R. Watkins, South Boston.
Dr. C. E. Watson, Broadway.
Dr. J. W. White, Luray.
Dr. H. P. Williams, Martinsville.
Dr. S. H. Williams, Alexandria.
Dr. J. L. Wright, Harrisonburg.
Dr. W. P. Yancey, Roanoke.

MEDICAL COLLEGE OF VIRGINIA

The annual Spring Postgraduate Clinic of the Medical College of Virginia was held at Richmond, April 25th, in connection with the Stuart McGuire Lectures. The following registered attendance:

Dr. L. H. Apperson, Richmond.
Dr. E. M. Babb, Ivor.
Dr. E. Barksdale, Lynchburg.
Dr. Q. H. Barney, Altavista.
Dr. Henry K. Beecher, Mass. General Hospital, Boston, Mass.
Capt. Bernard Sherman, Camp Lee.
Dr. Alfred Blalock, Vanderbilt University, Nashville, Tenn.
Lt. Harry Boas, Camp Lee.

Dr. Mary B. Baughman, Richmond.
Dr. L. R. Broster, Charing Cross Hospital, London, England.
Lt. A. S. Browdie, Camp Lee.
Dr. S. W. Brown, Camp Lee.
Dr. H. G. Byrd, Louisa.
Dr. B. L. Carleton, Newport News.
Dr. L. L. Clark, Chester.
Dr. George B. Craddock, Lynchburg.
Dr. J. G. Cutler, Camp Lee.
Dr. H. S. Daniel, Louisa.
Dr. A. C. Davis, Roanoke.
Dr. Fred F. Davis, Roanoke.
Dr. J. S. DeJarnette, Staunton.
Dr. R. G. Elliott, Camp Lee.
Dr. J. W. Freed, Staunton.
Dr. D. S. Garner, Roanoke.
Miss Dorothy Gayniar, Richmond.
Dr. James A. Grizzard, Drewryville.
Lt. L. J. Hampton, Camp Lee.
Dr. R. L. Hillman, Emory.
Dr. James M. Habel, Jetersville.
Dr. Paul Howle, Richmond.
Dr. J. D. Hutchins, Camp Lee.
Dr. Mary Johnston, Tazewell.
Lt. Carl Kritzer, Camp Lee.
Dr. L. P. Jones, Emporia.
Dr. E. C. Jamison, Rocky Mount.
Dr. Karl Lippert, Lancaster, S. C.
Dr. R. G. McAliley, Atlanta, Ga.
Dr. J. Y. McCoin, Camp Lee.
Dr. William McKibben, Miami, Fla.
Dr. M. E. McRae, Chatham.
Dr. H. L. Mannheim, Richmond.
Dr. Douglas Martin, Tampa, Fla.
Dr. C. H. Maxwell, Camp Lee.
Dr. Carleton Moorman, Altavista.
Dr. E. R. Moorman, Kilmarnock
Dr. G. S. Osincup, Orlando, Fla.
J. S. Pierce, Richmond.
Dr. Charles W. Putney, Staunton.
Dr. A. J. Rarick, Camp Lee.
Dr. I. Rifkin, Richmond.
Dr. William Robinson, Richmond.
Dr. M. P. Rucker, Richmond.
Lt. G. F. Salle, Camp Lee.
Dr. S. J. Saunders, Staunton.
Dr. B. S. Shapley, Camp Lee.
Lt. Ed. Sharp, Camp Lee.
Dr. H. B. Showalter, Kenbridge.
Lt. Harold Sisson, Camp Lee.
Lt. W. S. Sloan, Camp Lee.
Dr. W. P. Starling, Roseboro, N. C.
Dr. H. U. Stephenson, Richmond.
Dr. W. R. Tyson, Norfolk.
Braxton Valentine, Richmond.
Dr. W. C. Vernocy, Camp Lee.
Dr. B. W. Wilkinson, Clarksburg, W. Va.
Dr. John S. Wolf, Camp Lee.

Many members of the faculties of both colleges, not participating in the program were also registered.

GEORGE B. ZEHMER,
Executive Secretary.

Proceedings of Societies

The Tazewell County Medical Society

Held its regular bi-monthly meeting on May 8th in Tazewell. The program consisted of two papers on syphilis and its control—the first by Dr. Edward Holmes of the State Department of Health outlined the present-day concept of the handling of syphilis, and the second by Dr. J. S. Pearson, Jewell Ridge, was on the incidence of syphilis in industrial practice. Delegate and alternate to the state medical meeting were named at this time.

Plans are being made to entertain the members of the Mercer County (W. Va.) Medical Society at a buffet supper on June 26th, at the Tazewell County Country Club, at which time Dr. Walter B. Martin, president of the Medical Society of Virginia, will be the speaker.

MARY ELIZABETH JOHNSTON,
Secretary.

Roanoke Academy of Medicine.

At the regular meeting of the Academy on May 5th, the following officers were elected to take office October 1: President. Dr. M. H. Williams; vice-presidents, Drs. D. B. Stuart and A. M. Groseclose; and secretary-treasurer, Dr. H. B. Stone, Jr. All are of Roanoke.

New members were elected as follows: Dr. Elizabeth Lee, Dr. Julien H. Meyer, Dr. Grover C. Godwin, and Dr. June U. Gunter.

There were approximately sixty-five members in attendance. Refreshments followed the meeting.

The Mid-Tidewater Medical Society

Held its regular quarterly meeting at Gloucester Courthouse on April 22nd, at which time the following program was presented: Report on Gall-blad-

der Operation by Dr. O. T. Amory; A Case of Vaginal Atresia by Dr. Russell Buxton; and A Case of Undescended Testicle by Dr. A. A. Creecy. All speakers are from Newport News.

The next meeting will be held in Urbanna the fourth Tuesday in July.

Dr. J. M. Gouldin of Tappahannock is president of this Society and Dr. M. H. Harris, West Point, secretary.

The Medical Society of Northern Virginia

Met at New Market on April 8th. At the business session, several doctors were admitted to membership. Dr. James Rountree of Woodstock presented a paper on Injuries to Intervertebral Discs and Spinal Ligaments, and Dr. Leslie M. Bell of Winchester gave a paper on The Use of Iodine in the Treatment of Goiter. Luncheon followed the meeting.

Dr. J. B. McKee and Dr. J. E. Harris, both of Winchester, are president and secretary-treasurer, respectively.

The Amelia County Medical Society,

An active unit of the Fourth District and Southside Virginia Medical Society, held its annual meeting on April 24th, and elected the following officers for the ensuing year: president, Dr. G. Craig Eggleston, Amelia; vice-president, Dr. W. L. Davenport, Amelia; and secretary-treasurer, Dr. James L. Hamner (re-elected), Mannboro. Delegate and alternate to the State Society meeting were also elected at this time.

News Notes

Annual Meeting of the Medical Society of Virginia.

Indications are that there will be good attendance at the meeting of the State Society at Virginia Beach, October 6th-8th. Reservations should be made promptly by those who have a choice in their selection of a hotel. Names of the hotels open in the Fall, with rates, were published in the last issue of the MONTHLY. The Committee on Arrangements, composed of doctors from the Princess Anne and the Norfolk County Medical Societies, is working hard for the success of this meeting. Let's lend a hand and make this one of the best meetings ever by attending and taking part in the activities.

Each component society is urged to send its full quota of delegates for the business sessions.

American College of Physicians.

The twenty-fifth annual session was held in Boston, Mass., April 21-25, under the presidency of Dr. James D. Bruce, Ann Arbor, Mich. The program included symposia on Military Medicine and on Nutrition. The panel discussions and clinics proved especially interesting.

During this session announcements were made concerning the participation of the American College of Physicians in the program of national preparedness. Through grants made by the college to the National Research Council, Committee on Medicine, an extensive program is being carried on by Dr. James E. Paullin, of Atlanta, Ga., in connection with the classification of internists with regard to ability and availability for military service, the listings being turned over to the Surgeons General.

Through another grant by the College to the National Research Council, Committee on Medicine, the sum of $10,000 has been made available for special research projects which may be of value to our armed forces. The first project for which an assignment of these funds has been made was to Dr. Edwin Cohn, of Harvard University, for an investigation of the possibilities of utilizing fractions of bovine plasma in connection with transfusions into humans.

As a feature, aside from medicine, the Trustees and the Conductor, Serge Koussevitsky, of the Boston Symphony Orchestra, gave an exclusive and complimentary concert for the members assembled in Boston. In appreciation, the College presented Dr. Koussevitsky with a testimonial, signed by the President and Secretary General.

There were 306 physicians inducted to Fellowship, the following Virginians being in this group:

Dr. Staige Davis Blackford, Charlottesville.

Dr. Kenneth Dawson Graves, Roanoke.

Dr. Edward Bruce Mewborne, Newport News.

Dr. Collins Denny Nofsinger, Roanoke.

Dr. Oscar Swineford, Jr., Charlottesville.

Dr. Julian Ruffin Beckwith, Charlottesville, and Dr. Lewis T. Stoneburner, III, Richmond, were elected to associateship.

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This was the first occasion on which the College membership was extended to Cuba, and twelve outstanding physicians, all connected with the University of Havana, qualified.

Dr. Roger I. Lee, Boston, succeeded to the presidency, and the following officers were elected: president-elect, Dr. James E. Paullin, Atlanta, Ga.; vice-presidents, Dr. D. Sclater Lewis, Montreal, Que.; Dr. Thomas T. Holt, Wichita, Kan.; and Dr. Samuel E. Munson, Springfield, Ill. Dr. Wm. D. Stroud, Dr. George M. Piersol, and Mr. E. R. Loveland, all of Philadelphia, were re-elected treasurer, secertary general, and executive secretary, respectively.

The next annual session will be held in St. Paul, Minn., and the tentative dates are April 20-24, 1942.

Personnel Changes in State Department of Health.

Dr. James M. Suter, Health Officer of the Washington-Bristol Health Department, has been called to military duty. He discontinued his duties with the State Health Department on April 16th.

Dr. Charles L. Savage, Health Officer of Hanover County, resigned as of April 26th to enter the field of industrial medicine. Dr. John D. Hamner, formerly Health Officer of Southampton County, succeeded Dr. Savage as Health Officer of Hanover County.

Dr. Hubert D. Crow, formerly Assistant Health Officer of the Brunswick-Greensville-Mecklenburg Health District at Lawrenceville, has been transferred to Southampton County as Health Officer.

Dr. William P. Terry, Health Officer of Charlotte County, has been called to military service and will leave for his new duties on June 16th.

Dr. Hugh H. Trout,

Roanoke, was the guest speaker at an initiation banquet of the Brown-Sequard Chapter, Alpha Omega Alpha, of the Medical College of Virginia on May 7th.

Ex-Internes Association of the Medical College of Virginia

Met in Richmond on April 23rd, at the time of the Stuart McGuire lectures and the Spring Postgraduate Course of the college. There was an attendance of approximately 100 former internes. The following officers were elected: president, Dr. James T. Tucker; vice-president, Dr. Charles Nelson; and secretary, Dr. Nathan Bloom (re-elected). All officers are of Richmond.

The Society of Neurological Surgeons

Met in Richmond on May 1st, 2nd and 3rd, with the largest attendance in its history, the members and guests representing the larger universities in the United States and Canada. In the absence of the president, Dr. Howard W. Fleming of San Francisco, Dr. C. C. Coleman, the Virginia member, acted as host and presided over the scientific sessions. The program consisted of operations and scientific papers on the first and second days at the Medical College of Virginia and its hospitals. A feature of these was the participation in the program by three ex-residents in neurosurgery of the college—Dr. James G. Lyerly of Jacksonville, Fla.; Dr. Frank Mayfield of Cincinnati; and Dr. J. M. Meredith of the University of Virginia. At this time, also an interesting report was made by Dr. Howard C. Naffziger, professor of surgery at the University of California, on Neurosurgical Preparedness in our Medical Defense Program.

Dr. J. Jay Keegan of Omaha, Nebr., was elected president for the coming year, Dr. Wilder G. Penfield of Montreal, Canada, vice-president, and Dr. Winchell McK. Craig, of the Mayo Clinic, Rochester, Minn., secretary-treasurer. Boston, Mass., was selected as the 1942 place of meeting.

The last day of the convention was given over to a sight-seeing trip to Williamsburg, Jamestown and Yorktown.

Medical College of Virginia News.

Commencement exercises closing the one hundred third session of the college will be held June 3, 1941.

There are one hundred seventy-two candidates for graduation: seventy-four in medicine, thirty-five in dentistry, twenty-nine in pharmacy, and thirty-four in nursing.

Dr. Theodore Meyer Greene, McCosh Professor of Philosophy, Princeton University, will deliver the Commencement address.

Dr. William Newton Hodgkin, an alumnus of the school of dentistry of the college, class of 1912, and a member of the Council on Dental Education of the American Dental Association, will be awarded the honorary degree of Doctor of Science at the Commencement exercises.

The Commencement sermon will be given by Dr. Vincent C. Franks, Pastor, Saint Paul's Church, Richmond.

News From University of Virginia, Department of Medicine.

Dr. Edwin P. Lehman participated in a Postgraduate Course in Surgery conducted in Waycross, Georgia. The following discussions were presented: April 7th, Surgical Shock; April 9th, Water Balance in Surgery; April 10th, The Significance of the Cholecystogram; and on April 11th, Hyperthyroidism. At a meeting of the Eighth District Medical Society of Georgia on April 8th, he spoke on the subject, Heparin in the Prevention of Peritoneal Adhesions.

Dr. D. C. Smith attended the meeting of the American Dermatological Association in New Orleans and on April 10th presented a paper on Acanthosis Nigricans.

On April 15th, D. E. C. Drash addressed the Rockingham Tuberculosis Association and the members of the School of Nursing of the Rockingham Memorial Hospital in Harrisonburg. His subject was The Conquest Against Tuberculosis.

On April 15th, Dr. Sydney W. Britton gave a lecture before the Staff and Graduate School of Iowa State College at Ames, Iowa. He spoke on Form and Function in Primitive Mammals.

At the meeting of the American Physiological Society in Chicago on April 18th, Drs. E. L. Corey and S. W. Britton presented a paper entitled The Antagonistic Action of Desoxycorticosterone and the Antidiuretic Principle of the Posterior Pituitary Gland.

Dr. Lawrence T. Royster attended the Region No. 2 meeting of the American Academy of Pediatrics in Richmond and on April 25th gave a broadcast for the Academy on the subject, The Importance of Periodic Examination of Children.

Dr. John M. Meredith attended the meeting of the American Society of Neurological Surgeons in Richmond on May 1st and 2nd and read a paper on Experimental Head Injuries: a. The Inefficacy of Lumbar Puncture for the Removal of Erythrocytes from the Spinal Fluid; b. Can the Site and Degree of Intracranial Trauma Be Determined By Spinal Fluid Erythrocyte Counts?

At the meetings of the Virginia Academy of Science in Richmond on May 1st to 3rd, the following members of the Faculty of the Department of Medicine of the University of Virginia presented papers: The Synchronization of Cerebro-Cortical Potentials by Dr. Charlton Gilmore Holland, Jr.; Study of a Case of Osteosclerosis with Myeloid Leukemia, with Special Reference to the Extensive Extramedullary Blood Formation by Drs. H. E. Jordan and James K. Scott; Autopassive Local Sensitization and Desensitization by Drs. Oscar Swineford, Jr., and W. Roy Mason, Jr.; Chemistry and Sulfonamide Drugs by Dr. Alfred Chanutin; Heparin and Peritoneal Adhesions by Dr. Floyd Boys; and An Analysis of Hormonal Influences on Fluid Balance by Drs. S. W. Britton and E. L. Corey.

Dr. Charlton Gilmore Holland, Jr. attended the organization meeting of the American Federation for Clinical Research in Atlantic City on May 5th and discussed his work on Electroencephalographic Studies in Myoclonia.

On May 6th, Drs. J. Edwin Wood, James K. Scott and John L. Guerrant presented a paper on Further Observations on Blood Pressure, Weight and Diet in Normal Hypertensive Dogs, at the meeting of the Association of American Physicians.

Drs. George C. Ham and Eugene M. Landis attended the meeting of the American Society for Clinical Investigation in Atlantic City and delivered a paper on A Comparison of Pituitrin and Antidiuretic Substance in Human Urine and Placenta.

Dr. W. M. Craig, Professor of Neurosurgery at the Mayo Clinic, visited the Medical School on May 5th.

The Department of Physiology was awarded a research grant of $2,000 by the Committee on Research in Endocrinology of the National Research Council, for investigations on the function of the suprarenal under the direction of Dr. Sydney W. Britton.

On May 7th, Dr. Staige Davis Blackford addressed the Augusta County Medical Association on the subject, Medical Treatment of Peptic Ulcer.

At the meeting of the West Virginia State Medical Association in Charleston on May 14th, Dr. T. J. Williams spoke on The Management of the Toxemias of Late Pregnancy. On May 15th, he ad-

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dressed the West Virginia Obstetrical and Gynecological Society on the subject, Experience in Postpartum Sterilization.

On May 1st, Dr. T. J. Williams participated in the Postgraduate Course in Medicine and Surgery for the Loudoun County Medical Society conducted under the auspices of the Department of Clinical and Medical Education of the Medical Society of Virginia. His subject was Toxemias of Pregnancy. On May 15th, Dr. H. B. Mulholland discussed The Newer Phases of Pneumonia Treatment.

At the meeting of the American Psychiatric Association in Richmond on May 5th, Drs. David C. Wilson and Charlton Gilmore Holland, Jr. presented a joint paper on Electroencephalographic Studies in Myoclonia.

Dr. C. M. Caravati,

Richmond, is now in Baltimore at The Johns-Hopkins Hospital where he is working in the Department of Gastro-Enterology and Nutrition. After several months away he expects to return to Richmond to continue practice and to limit it to this specialized field.

Dr. Leslie M. Bell

Has recently located in Winchester, where he is associated with Dr. James A. Miller and limiting his practice to surgery and gynecology. Dr. Bell is an alumnus of the Harvard Medical School, class of '35, following which he served as house officer for a year in the New England Deaconess Hospital, Boston. Later, he served a three-year internship in surgery and gynecology at the Roosevelt Hospital, New York, after which he was for two years on the surgical staff of the Massachusetts Memorial Hospital and the Boston University Medical School, where he was first assistant to Dr. Howard M. Clute.

Dr. Algerd Powell,

Recently of Roanoke where he was assistant medical examiner for the Norfolk and Western Railway Company, has located in Buena Vista, in the offices of the late Dr. F. L. Thurman, and is engaged in general practice. Dr. Powell is a graduate of the New York Medical College and later interned at the U. S. Marine Hospital, Norfolk.

The Virginia Society of Ophthalmology and Oto-laryngology

Held its twenty-second annual meeting in Richmond on May 10th, under the presidency of Dr. G. G. Hankins, Newport News. Officers were elected as follows: president, Dr. Mortimer H. Williams, Roanoke; president-elect, Dr. Guy Fisher, Staunton; and secretary-treasurer, Dr. Meade Edmunds, Petersburg. The next meeting will be held in Staunton in May, 1942.

American Psychiatric Association.

At the ninety-seventh annual meeting of this Association in Richmond, May 5th-9th, there was a registered attendance of 1,453—the largest number in the hitsory of the organization. Dr. James K. Hall, Richmond, was installed as president; Dr. Arthur Ruggles, Providence, R. I., was named president-elect; and Dr. Winfred Overholser, Washington, was chosen secretary-treasurer.

Medical Section, Virginia Academy of Science.

At the meeting of the Academy in Richmond, early in May, Dr. J. E. Kindred, University of Virginia, was elected chairman of the medical section, with Dr. Guy Horsley, Richmond, being re-elected secretary-treasurer.

Dr. C. C. Coleman,

Richmond, has recently been appointed by Governor Price to the Board of Visitors of William and Mary College. He is also president of the Richmond Alumni Club of the college.

Hugh Mercer Apothecary Shop a Shrine.

Appropriate exercises on April the 30th marked the taking over of the Hugh Mercer Apothecary Shop in Fredericksburg by the American Pharmaceutical Association as a shrine to their profession. This is one of that city's most prized historical shrines, its customers including George Washington's mother, John Paul Jones of Revolutionary fame, and others. Dr. Mercer closed the shop at the beginning of the Revolutionary War to enter the army and was fatally wounded in the battle of Princeton.

Dr. Louise Fry Galvin

Has returned to her work in Richmond, after a month in New York, where she did special work in children's diseases at the Cornell Medical Center.

Dr. Linwood D. Keyser,

Roanoke, has just returned from Colorado Springs,

where he attended the American Urological Association of which he was a member of its executive committee. He was also chairman, this year, of the motion picture exhibits.

Dr. James Q. Gant, Jr.,

Class of '35, Medical College of Virginia, connected with the U. S. Public Health Service, has just been transferred to the Office of Dermatoses Investigations, National Institute of Health, Bethesda, Md.

Dr. and Mrs. William Lett Harris,

Of Norfolk, will spend July and August at Courtney Terrace, Virginia Beach.

St. Elizabeth's Hospital.

The twenty-ninth annual report of St. Elizabeth's Hospital, Richmond, recently published, includes a record of all patients admitted and treated at the hospital during 1940.

The report is arranged along the same general plan that has been used for several years, with the addition of a report from the Dietary Department, giving as one of the interesting features a summary of the special diet trays served throughout the year. The list of publications of the Staff and statistics of the Out-Patient Department and laboratory, as well as those of the School of Nursing, are in the first part of the report, followed by a record of the diagnosis and operation on all cases admitted. The usual critical resume of the deaths is in the last portion of the report.

The total number of patients admitted during 1940 showed an increase of 134 over 1939, the largest number of admissions during any year at this hospital. It is interesting to note that the average stay per patient during 1940 was one day less than that of 1939. There was a definite increase in surgery of the gastro-intestinal tract in 1940 over previous years, with almost twice as many gastric resections as in 1939. The number of appendectomies was 225, about the same as for the previous year, but there were five more drainage cases. There was also a definite increase in the number of rectal operations in 1940, with a total of 114, compared with eighty-four in 1939. The amount of prostatic surgery has increased; there were five prostatectomies and forty-one transurethral resections in 1940 compared with two prostatectomies and twenty-one transurethral resections in 1939.

There were fifty-two deaths in 1940, with thirty-six necropsies (69 per cent). Though this is a lower percentage of necropsies than for the past two years, it is still well above the average for a private hospital.

Dr. Mowey Presberg,

Recently with the Veterans Hospital in Roanoke, is now connected with the Veterans Administration Facility at Lyons, New Jersey.

Film Free for Use by Physicians.

Under the rules laid down by the American Academy of Pediatrics their new educational-to-the-public film, "When Bobby Goes to School", may be exhibited to the public by any licensed physician in the United States. All that is required is that he obtain the endorsement by any officer of his county medical society. Endorsement blanks for this purpose may be obtained on application to the distributor, Mead Johnson & Company, Evansville, Indiana. Such endorsement, however, is not required for showings by licensed physicians to medical groups for the purpose of familiarizing them with the message of the film.

"When Bobby Goes to School" is a 16-mm. sound film, free from advertising, dealing with the health appraisal of the school child, and may be borrowed without charge or obligation on application to the distributor, Mead Johnson & Company, Evansville, Indiana.

Directory of Medical Specialists.

Specialists eligible for listing in the forthcoming second edition of the Directory of Medical Specialists, 1942 edition, are urged to fill in and return promptly the questionnaires for biographic data just mailed them.

This Directory is the official publication of the Advisory Board for Medical Specialties, issued every two years, and listings are limited to those formally certified by any of the fifteen American Boards examining in the medical specialties. There is no charge for such listings. The second edition is now being prepared, and will be ready for distribution early in February, 1942, with biographic, geographic, and alphabetic listings of all diplomates certified to January 1, 1942. It will include approximately 18,000 names.

The Directing Editor is Paul Titus, M. D., 1015 Highland Building, Pittsburgh, Pennsylvania, and

the secretaries of the fifteen American Boards constitute the Editorial Board.

Wanted—

Physician. Preferably young man who has had some experience in psychiatry or who wishes to enter this field, as associate in psychiatric work at nervous and mental private hospital. An attractive position with opportunity if he succeeds in the work. Address "BXY", care of this journal. *(Adv.)*

Good Practice For Sale.

If I can sell my practice and residence, I will retire on account of age and turn office and everything over to buyer. This is in a good town of about 5,000 inhabitants and a good country to serve. Only two other physicians. A young to middle aged man could easily make four to six thousand dollars a year. If interested, address No. 155, care VIRGINIA MEDICAL MONTHLY, 1200 East Clay Street, Richmond. *(Adv.)*

For Rent—

At Ridgeway, Va., three-room furnished and equipped office. One room filled with medicines. Good opening for doctor and drug store combined. Owned and occupied by Dr. J. B. DeShazo, deceased. Write or call Mrs. F. A. Hayes, Box 307, Elon College, North Carolina. *(Adv.)*

For Sale—

Treatment room furniture and sterilizer. Furniture is Aloe white Steeline, in very good condition, practically new. Sterilizer is large table size, in excellent condition. Owner now in Army Service, but arrangements may be made to see furniture. Address "L", care this journal. *(Adv.)*

Obituary Record

Dr. William T. Oppenhimer, Jr.,

Richmond, son of Dr. and Mrs. W. T. Oppenhimer of this city, died April the 20th, after a short illness. He was a native of this city and, upon completion of his academic education, entered the Medical College of Virginia, from which he graduated in 1917. He immediately entered the U. S. Navy and was active in that branch of the service during the World War. Upon completion of his service, he returned to Richmond and was engaged in practice with his father. He was a member of the Medical Society of Virginia and of other professional and social organizations.

Dr. Aurelius Rives Shands, Sr.,

Prominent physician of Washington, D. C., died at his home in that city on April 27th. He was born in Petersburg on November 5, 1860, and received his medical degree from the University of Maryland in 1884. Dr. Shands became professor of orthopedic surgery at Columbia University (now George Washington University) in 1894 and at the time of his death held the title of professor emeritus. He was a member and past president of the American Orthopedic Association. Dr. Shands had been a member of the Medical Society of Virginia since 1894 and was elected to Honorary Membership in 1904. His wife and three sons, one of these Dr. A. R. Shands, Jr., of Wilmington, Delaware, survive him.

Resolutions on Dr. George J. Tompkins.

At a meeting of the Lynchburg Academy of Medicine, held at the Lynchburg General Hospital at 8:00 P. M. on May 5, 1941, the following resolution was unanimously adopted:

Whereas, Doctor George Johnson Tompkins, born at "Stono," Lexington, Va., March 27, 1873, a member and former President of this Academy, having practiced in Lynchburg since May 1, 1899, specializing in diseases of the eye, ear, nose and throat, departed this life on April 2, 1941.

BE IT THEREFORE RESOLVED that the Lynchburg Academy of Medicine express, by this resolution, its profound feeling of loss to its members and to this community in the death of Dr. Tompkins, who had served his friends, his profession and his community with fidelity, integrity and a skill tempered by wisdom; who had been active in his work in this Academy, in the Medical Society of Virginia, and in numerous local civic bodies; who had long served in the Lynchburg General Hospital, largely giving of his efforts there to the city's indigent, and in the clinic of the Junior League; who was a faithful member, vestryman and senior warden formerly in St. Paul's Episcopal Church and later in Grace Memorial Episcopal Church, in the establishment of which he had a large part; whose attitude toward his associates was an outstanding feature of his character; who showed to all who knew him a friendship, a tolerance, and a philosophy of life, that greater "peace between body and spirit", a way of service, a life of loyalty, a spirit that "shall cease to be never; birthless and deathless and changeless", and

BE IT FURTHER RESOLVED that a copy of this resolution shall be sent by the Secretary to the family of Dr. Tompkins as a memorial of the sympathy of this Academy in their great loss.

JAS. R. GORMAN
BERNARD H. KYLE